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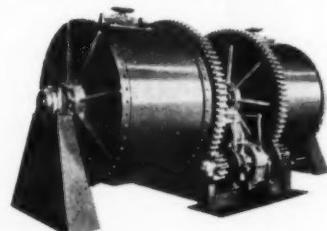
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Saves time and labor. Strains through a vertical screen — no clogging. Long-life screen often saves enough to pay for the equipment. Standard and Junior sizes. May be suspended or placed on floor. Capacity ranges from 300 to 1,000 gallons per hour, depending on the nature and specific gravity of the product, screen mesh and size of sifter. Descriptive folder sent on request.



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Steveco high-efficiency duplex mills wet-grind porcelain enamel materials better, faster and at low cost. Many outstanding construction features proved in hard day-after-day service in many plants. Wide range of sizes and linings, with all types of drives. Write for catalog, then let us study your grinding needs and recommend the correct type for your requirements.



# THE *Finish* Line

**REFRIGERATOR OPPORTUNITY** — Again we say, there is a real opportunity for the manufacturer who *first* introduces a "standard" refrigerator of popular size with porcelain enameled exterior, and prices it with a differential to cover only a proved difference in manufacturing cost, *if any*.

#### Buy the gadgets — or else

Porcelain enameled refrigerators formerly sold to the consumer at from \$20 to \$30 higher than "standard" lines of comparable capacity. In addition to porcelain enameled exteriors, the "De Luxe" lines had more conveniences and additional gadgets to account for the difference in cost. Nevertheless, the buyer who wanted a porcelain enameled refrigerator exterior had no choice but to pay the "De Luxe" price, including the gadgets. He could not buy a "standard" model with porcelain enameled exterior.

#### The pricing problem

There *could* be an opportunity for the refrigerator manufacturers who produced these "De Luxe" lines for sale at premium prices before the war. With prices controlled, why not put the de luxe line on a high production basis? In other words, make it standard!

More than one manufacturer has said that if porcelain enameled refrigerators were produced in comparable quantities to those with organic finishes the cost would

also be comparable. It will pay the manufacturer to check material costs and check "metal finishing" costs — the data may offer engaging possibilities.

#### An all-porcelain "standard" line

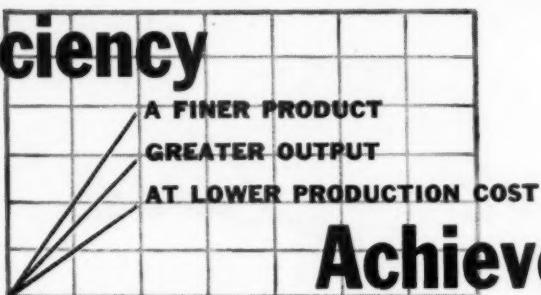
Again we say, the development of an all-porcelain "standard" line, backed by sound promotion, will give a wide awake manufacturer the lead in a trend that must inevitably come if the refrigerator cabinet is to keep pace with mechanical improvements.

Wars do bring cheap merchandise to the forefront in every line — but wars also develop discriminating buyers by the thousands. That there is a tremendous pent-up demand for refrigerators no one would question — *read the report on page 31 of this issue*. But — if there is any one outstanding thing that the pre-war appliance buyers have learned during the war years it is the value of *permanence* in household appliances.

The new year, *and the years to follow*, promise to be bright for the refrigerator producer who *first* takes the "bull by the horns" and offers the "De Luxe" finish (porcelain enamel) on the exterior of his "standard" lines. Match the long life mechanism with a longer life exterior finish, and the answer is *permanence* and *customer satisfaction* for the appliance producer.

Dana Chase  
*Editor and Publisher*

# Peak Efficiency



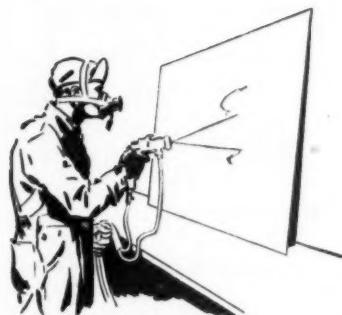
Achieve it with

## INLAND TI-NAMEL<sup>\*</sup> STEEL

The finest smooth finishes with reductions in cost, both in working the metal and applying the enamel, plus a saving of time and increased production are what you gain with TI-NAMEL. It's a newly developed product of Inland's research laboratories.

TI-NAMEL steel has the smooth surface and the ductile strength of the finest deep drawing sheets enabling many parts to be formed without welding—saving time, labor, floor space and equipment.

No ground coat is needed. The alloy in TI-NAMEL seals in the carbon, making it difficult for hydrogen to penetrate at firing temperatures. Thus, with the cause of specks, pits and blisters minimized, conventional cover coats may be applied directly to the



metal. This, plus the fact that brushing or edging can also be eliminated, saves time, labor and space.

As a further aid to a better product, TI-NAMEL stays flat during firing, has greater resistance to sag, is free from age-strains and welds easily. Full details are given in a new bulletin. Write for your copy.

Pending patent applications on the new enameling process and product made thereby are owned jointly by Inland Steel Company and Titanium Alloy Manufacturing Company under trust agreement.

Inland Steel Company, 38 S. Dearborn St., Chicago 3, Ill. Sales Offices: Cincinnati, Detroit, Indianapolis, Kansas City, Milwaukee, New York, St. Louis, St. Paul. Principal Products: Bars, Structural, Plates, Sheets, Strip, Tin Plate, Floor Plate, Piling, Reinforcing Bars, Rails, Track Accessories.

\*TRADEMARK—REG. U. S. PAT. OFF.

# INLAND STEEL COMPANY

# "Vitreous enamelling" in Australia

the history of one of Australia's oldest manufacturing and "enamelling" companies, plus comparisons with American manufacturing.

By T. B. Simpson • ASSOCIATE DIRECTOR AND

S. H. Dunstone • ASSISTANT DIRECTOR & WORKS SUPERINTENDENT,  
A. SIMPSON & SON LTD., ADELAIDE, SOUTH AUSTRALIA



We have just completed a tour of manufacturing and enamelling plants in the United States and Canada, and have been asked to prepare a story for *finish* on the activity of our company in Australia, with any comparison comments which seem to be in order.

In some respects it might be possible to draw close comparisons between manufacturing procedures, enamelling processes and even finished products as produced in the United States and in Australia. For reasons which will be explained, this comparison has its limits.

After visiting plants throughout North America, we can say that in general the metal product manufacturing and vitreous enamelling are quite comparable to Australian methods. In fact, a number of products manufactured in Australia are almost identical with the ones marketed in the States. A Kelvinator refrigerator, for instance, is generally similar in design and construction, whether it is built in Grand Rapids, Michigan, or in Keswick, South Australia. Close cooperation between manufacturing organisations in the two countries has made this possible.

The greatest difference appears in the quantity of products manufactured. This is the result of the vast difference in population. Australia, with its 3,000,000 square miles of territory, has a population of only 7,000,000 people. Approximately two-thirds of this population is concentrated in the larger cities and along the sea coast, leaving vast areas of sparsely populated territory which, in themselves, present a very limited

market for manufactured products.

## No "straight line" production

This leads to the most noticeable difference between manufacturing plants in the two countries. The trend in the United States to large volume, straight line production on single products seems entirely logical where vast markets make such a plant not only possible, but economically sound. We were in a number of plants in the States, for instance, where five hundred cooking ranges is a normal day's production. We understand in many of these plants production will be increased considerably when civilian products are again produced in quantity. To meet the requirements of the Australian market for full-size cooking ranges would require a total of only 200 wood ranges per day, and about the same for gas and electric combined, by all manufacturers.

In contrast to this, a large manufacturer in Australia may produce several thousand different items in great variety, with each in too small a quantity to make straight line production economical. Other results of Australian conditions are that organisations making American-designed products in Australia will often have to depart from their original, to spread the tooling costs over a wider range of sizes, or to allow more hand work in each unit and less work in the tooling, and also, except in the refrigerator industry, it is not the practice to bring out a new model every year.

## More color used

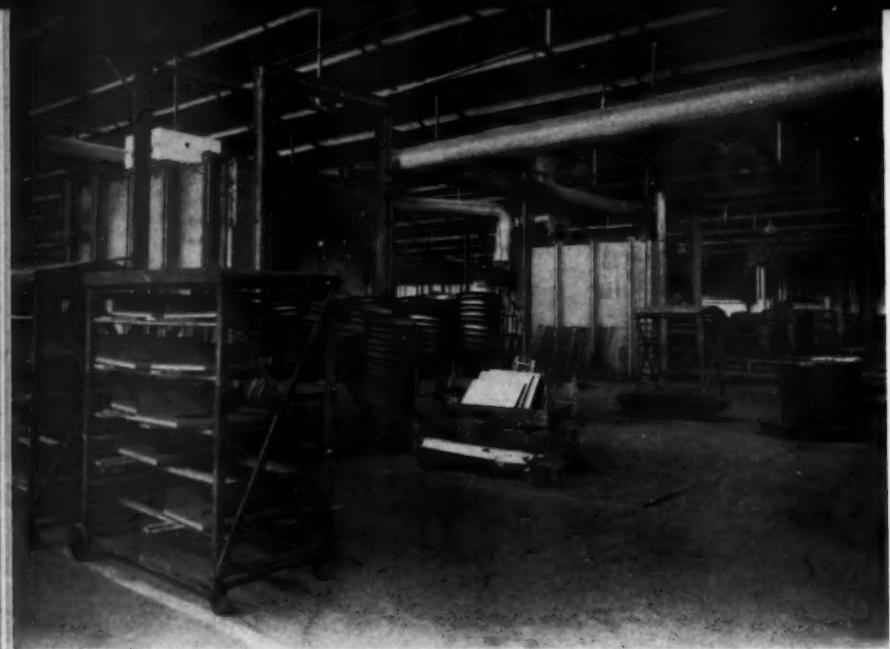
One thing that we noticed is that here in Australia we use a great deal more color in our vitreous enamelled products than is used in the

States. The great use of white for appliances and kitchen ware is probably also the result of your "streamlined" production methods. Here, where we produce a greater variety of products in small quantities, color is used quite extensively and the buyer is accustomed to expecting colorful enamelware.

We, in Australia, try to take advantage of all modern improvements in manufacturing and enamelling, and feel we have been reasonably successful in this endeavor. There are a few advantages which we can not hope to gain — such as large volume production of frit and some of the continuous plant operations — because of limited production. A typical example of this is the one piece or wrap-around bodies for stoves and refrigerators.

## The story of A. Simpson & Son Ltd.

To sketch the history of our company requires that we look back to March 18, 1820, when Alfred Simpson was indentured as a Tinplate Worker Apprentice to Amos Burkitt of Southwark, for which Mr. Burkitt was paid the sum of £80. As an Apprentice he received little or no definite payment, but on the termination of his articles it is said that Alfred Simpson was given a silver watch. His name was duly entered in the Books of the Worshipful Company of Tinplate Workers, where the name of a grandson followed a century later, and in May, 1828, he became a Freeman of the City of London. The period of indentures was long — eight years — but the indentures may have been cancelled soon after August 12th, 1826, when he became twenty-one. In those days power machinery was unknown to the



*View in the enamelling plant at A. Simpson & Son Ltd., Adelaide, S.A.*

industry, and the young tinsmith, seeing no opportunities in the trade he had learned, joined elder brothers who were becoming prosperous merchants in Leadenhall Street.

He came to South Australia in 1849 with his wife and family in the sailing ship "John Woodhall." After a venture in storekeeping and adventures in the Victorian Gold Diggings, he met a Tinsmith who persuaded him to start a business in his original trade — first in Topham Street, and later in Rundle Street.

#### **Back to tinsmithing**

In 1855 he moved to a four roomed, shingle roofed cottage in Gawler

Place. Half the front verandah was occupied by a shoemaker and his apprentice, and the other half used as a workshop.

Two or three years later his son (the late Mr. A. M. Simpson), left school to join him, and when he became twenty-one, on April 4th, 1864, was admitted as a partner.

#### **A better "mouse trap"**

It is usual to hear of the Pioneer's opportunities, but Mr. Alfred Simpson began in Gawler Place when there were seven Tinsmiths established in the City of Adelaide, and he attributed his subsequent success to supplying tinware of a gauge thicker than

his competitors. As a consequence of this, for eighty years the people of South Australia have been educated to prefer stronger tinware than is generally used in other States of the Commonwealth.

Gradually he was able to secure the leases of adjacent cottages, and the "Colonial Tinware Manufactory," as he styled it, was extended.

The manufacture of fire and thief resisting safes began about the middle of the Sixties, and in 1866 permission was obtained from Mr. William Townsend, the Mayor, to expose a safe to the test of a large specially prepared fire in the Parklands.

Twelve years of hard work and frugality enabled Alfred Simpson to reside away from his business and to rent a small house in King William Street, Kent Town, where afterwards he bought a more substantial dwelling, and in 1868 a new "Colonial Tinware Manufactory" was built.

#### **Tin cans and sheet iron ovens**

From a very early date black sheet iron ovens were made, which were later improved to Simpson's patent oven by the addition of a cast iron top plate.

Ovens for canning meat and jam were also amongst the early products — begun probably not later than 1861.

The iron bedstead industry followed later — the first pattern made was sketched by Mr. A. M. Simpson about 1869 from a photograph, but the trade was unimportant for years. In 1872 the records show the value of bedsteads sold was less than that of wicker perambulators, which in those economical days were much required.

In the Seventies the firm began the purchase and lease of additional property, and in 1878 Mr. A. M. Simpson made the first of his visits abroad which contributed much to the growth of the enterprise. In Brooklyn, N.Y., he made the acquaintance of the late Mr. E. W. Bliss, and crossed the Atlantic with him to the Paris Exposition, where he saw and purchased what became the first double action drawing press in Australia. During the next thirty

*Another section of the enamelling plant with furnace in operation.*



five years, most new plant equipment was bought in the U.S.A.

#### Early range manufacture

In the Eighties the manufacture of large ranges began, and though many castings were imported, a foundry was established in a corner of the bedstead department at Freeman Street for factory jobs and occasional orders, the original staff consisting of one moulder and a boy. In 1925 that foundry, transferred to Wakefield Street, had become the largest private user of pig iron in the State.

About 1876 the firm erected a galvanizing plant, and three years later tinning was first introduced into South Australia.

In 1891 Mr. Alfred Simpson died, not long after having attained his eighty-sixth year. It had been a long struggle for success in Gawler Place but he lived long enough to enjoy years of leisure in robust health, and to see the little shop expand into the largest tinware factory in Australia.

In 1894, two acres of vacant land in Wakefield Street were bought, and during the following year new works added which, with adjacent property purchased, covered three acres.

#### Enamelled hollow-ware and signs in 1898

Here in 1897 an electro-plating department was set up to satisfy a demand for nickel-plated bedstead fittings, that till then had been made after the English fashion in lacquered brass only. In the following year buildings and coal fired furnaces for melting the enamel and firing the ware were erected for the manufacture of vitreous enamelled hollow-ware and advertising signs — allied industries never previously engaged in by Australian manufacturers, and which occupied a considerable area of the Wakefield Street Works. An experienced enameller was brought out from England, and he trained local men and women.

Early in 1909 the firm became a Limited Company, the directors being the chairman (Mr. A. M. Simpson) and his sons, Messrs. A. A. and F. N. Simpson.

The expansion of the business has



This "production line" for "stoves" contrasts with American methods.

since been more in new lines than new industries. The 1st World War created a demand for many sheet metal articles for military purposes that naturally stopped development in manufactures of civil utility.

On September 28th, 1917, Mr. A. M. Simpson died at the age of seventy-four years — with singular ability in his own business he combined an interest in politics, boards of large public companies, and in the management of charitable institutions.

He was succeeded as chairman by the late Mr. A. A. Simpson, who died in 1939. The company has since continued under the directorship of his surviving son, Mr. F. N. Simpson,

Mr. J. A. H. Minagall and Mr. A. M. Simpson, a grandson. Other grandsons on the staff are Mr. T. B. Simpson, and Lt. Col. R. A. Simpson and P/O J. McK. Simpson, at present on service.

#### Cast iron enamelling

##### started in 1929

In 1923, the manufacture of modern steel window frames was added to the safe department, and in 1929 enamelling cast iron was begun, using enamel imported from England and America.

#### Enamelled "license" plates

In 1932 an order was received

Corner of display room showing a few of many products manufactured.





Vitreous enamelled water bottles were used by the Australian Army in both the 1st and 2nd World Wars.

from the Victorian Police Department for 170,000 pairs of enamelled, embossed motor car number plates, which was said to be a record for the Empire.

In 1933 tin printing was added to the enterprises of the company, and machinery was set up for the new industry of metal spraying.

#### Present expansion program

New building was started in 1939 to bring together all of the various activities of the company in one large plant. The buildings are all of steel construction, the fabrication of which was handled in our own plant. They were also built entirely by our own organisation.

Production was never stopped. As a shop was built, the machinery was shifted from its former location—and as the next building was completed the same procedure was followed. All machinery and equipment was shifted at night and on weekends. In one instance, a section containing twenty light presses was moved by stopping work in the afternoon about 4:15. All presses were taken out, transported to the new factory and set up ready to start running the new shop for the morning shift.

This method of expanding will probably sound quite strange to the large American manufacturer accustomed to calling in specialists for planning and constructing new plants

in the shortest possible time.

We finished shifting from the old plants to the new about November, 1944. This completes the plant except for a foundry and an office building. Completed factories will comprise approximately fifteen acres. The largest building has about 436,000 square feet of space. The enamelling shop comprises 70,000 square feet, and houses four box type furnaces—two electrically heated and two designed for oil; only one of these is at present in use; the other is fired with gas tar, as a war time measure, oil being imported and thus in short supply.

Two features of the new plant should be interesting. The roofs of the pickling section of the enamel shop, and of parts of the tinning and galvanizing are of vitreous enamelled steel to resist corrosive conditions. In addition, one complete wall of the enamel pickle room is lined with vitreous enamelled steel—the other wall being cement.

#### Enamel processing

The method of processing the work is that black shapes come in from the press or fabricating departments to the metal cleaning section, where they are loaded into monel crates and placed successively in the metal cleaning tanks by an electric crane, travelling on a monorail. From there the work goes out into the shop where the ground coat is applied, usually by liquidising, and it is then hung on an overhead monorail conveyor which takes it through a steam and oil

heated drier, of American design, at the other end of which it is loaded on to wheeled racks on which it is held until it is fired.

The cover coat is applied either by liquidising or spraying; tipping the edges of most of the hollow-ware is done wet, but the edges of the refrigerator liners, stove door panels, etc., are done after passage through the same conveyor as is used for the ground coat.

Cast iron work is shot-blasted in a separate building, and thereafter goes through the same process, except that all coats are applied by spraying.

Part of the enamel is made in rotary smelters; the frit from this section, and that bought outside, is taken by monorail travelling over the mills, and dumped into them. The large mills are controlled by time switch, the others manually. The dipping weight is controlled in a laboratory, but on account of the continual variation in the type of work going through, the control is not as close as in American practice.

While we have facilities for manufacturing our own frit, some of it is purchased elsewhere. Our steel is all Australian produced, although American experience is used to the extent that an American subsidiary, Commonwealth Rolling Mill Company Ltd., rolls our enamelling iron.

#### From tinware to washing machines

As will have been noticed, the production of our company covers prac-

to Page 50 →

A display of vitreous enamelled kitchenware as manufactured in Australia.



# New pickling room has many features

important reading for those who are building or modernizing pickle room installations

By M. B. Smith • PLANT ENGINEER AND  
Richard Carno • PORCELAIN ENAMELING SUPERINTENDENT, O'KEEFE & MERRITT COMPANY,  
LOS ANGELES, CALIFORNIA

ONE major project included in our wartime plant expansion program was the rebuilding of our pickling room, which was inadequate and rapidly deteriorating. We were operating on a 24 hour schedule which meant not only high maintenance cost, but made it difficult to get and hold operators, especially on the night shift. Practically all items we produced had to be cleaned and pickled prior to finishing and, due to rigid Army and Navy specification, most of them had to be cleaned and pickled before welding or fabricating.

It is our thought that, perhaps, certain of the innovations we have in-

corporated in this new installation will be of interest to the Enameling Industry.

Several considerations were kept firmly in mind during design and layout of this department. In addition to ample cleaning and pickling facilities, we wanted each facility as near foolproof as possible. This meant use of automatic or semi-automatic equipment wherever it could be applied. At the same time we wanted to make provision for efficiency in parts handling, ease in solution control, and desirable working conditions for plant personnel.

The final blueprint called for eleven tanks, each 13 feet long, 6 feet wide,

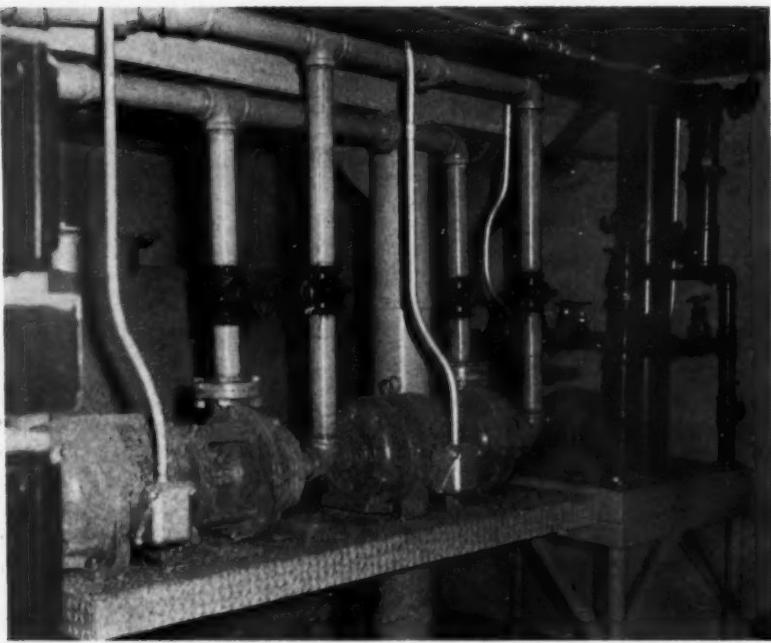
and 7 feet deep. Eight of the tanks were for ordinary cleaning and rinse solutions, two tanks for acid, and the eleventh tank to be used as a drier. The solution tanks are of ordinary welded sheet steel construction. The acid tanks are of steel construction lined with Koroseal and provided with an armor of vitrified brick set in Elaterite to protect the lining from injurious contact with the baskets.

## Good lighting provided

Each tank is provided with individual overhead lighting, with the light switch conveniently near the working end of the tank. During daytime, a bank of windows in the opposite wall

*Here's what a modern pickle room should look like. Partial view of pickling room described, showing lighting over each tank. There is a complete air change every forty-five seconds.*





Pumping room with acid tank (in rear). Solutions may be transferred between tanks or drained directly into sump.

adds to the brightness of the department. An air "conditioning" installation changes the air in the cleaning room every 45 seconds, thus providing a clean, dust-free atmosphere in which to handle the work, and eliminating fumes and other odors offensive and harmful to cleaning personnel.

An overhead air hoist, power-driven on the track, is used for handling the Monel baskets in and out of the tanks. The work baskets themselves have been carefully designed to facilitate loading and unloading, while at the same time utilizing the full cleaning capacity of the tanks. Skimming is accomplished by side troughs at solution level, and solution scum is impelled into the troughs by convection currents set up in the tanks by the heating coils. It is planned to install compressed air pipes for solution agitation in the near future.

#### Electric pumps — manifold system for handling solution

Efficient solution handling is assured by a manifold system and battery of electrically operated pumps. By means of this manifold system, solutions may be transferred at will between any of the eight cleaning

tanks, or pumped directly into a three-stage drainage sump. The design of the drainage sump facilitates mixing of neutralizing solutions with the acid solution prior to its entry into the sewer.

Each tank is heated by a pair of

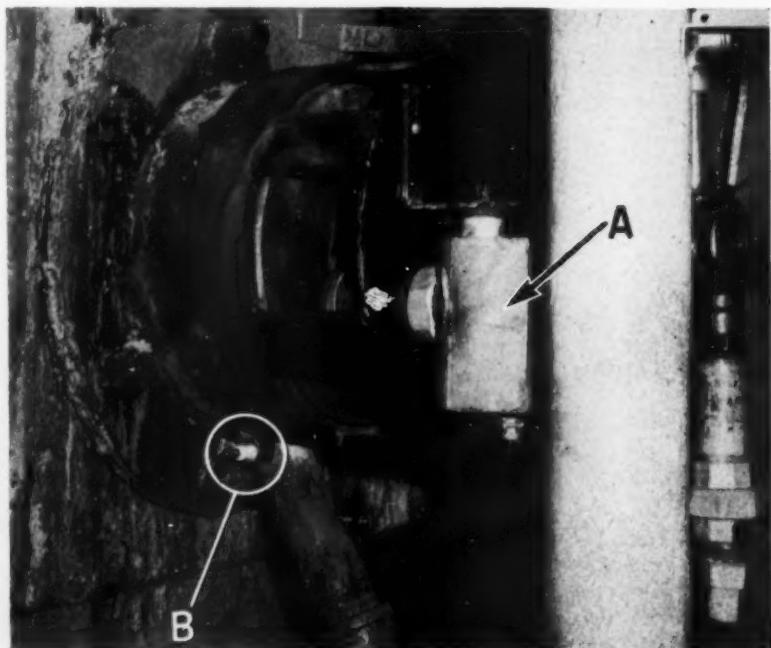
10 inch submersion U-type burners operating on natural gas with an oil burner stand by. There was some doubt during installation of these burners, as they are much larger than the usual 6 inch type. Tests after installation, however, indicated an overall efficiency of 86 per cent. The thermal capacity of these large burners is a distinct advantage in maintaining desired solution temperatures.

#### Electronically controlled burners

One installation that is proving very effective is an "electric eye" or photo-electric cell that scans the burner and pilot light in each burner installation. When the burner goes out for any reason, the electronic cell responds immediately by setting in motion apparatus to turn off the gas supply to the affected burner. At the same time it sounds a continuous warning signal to attract attention of maintenance personnel. This installation is a decided safety factor, as it eliminates the possibility of unburned gas escaping into the heating tubes and surrounding vicinity. The cell is operated through appropriate connections to a 110-volt AC current supply.

#### Electrically ignited pilots *Page 52 →*

"Electric eye" installation (A) for scanning burner flame. Cell operates to shut off gas when flame goes out; also sounds warning. Igniting spark plug (B) eliminates hand lighting.



# Resistance welding

## prior to porcelain enameling

adapted for finish from a talk before the Chicago District Enameling Club

By Clyde G. Bassler • DISTRICT MANAGER, THE TAYLOR WINFIELD CORPORATION

IN DISCUSSING the subject of resistance welding prior to porcelain enameling it becomes immediately necessary to divide the subject into the four divisions of resistance welding: Spot, projection, roll seam and flash-butt seam welding. I think enamelingers are sufficiently familiar with these four divisions to eliminate the necessity for explanation of the basic procedure.

### Spot welding

As far as the application of spot welding of assemblies prior to porcelain enameling is concerned, the problem is much the same as that confronting the user of the process in the fabrication of any high grade article requiring a combination of greatest possible strength and best possible appearance. This requires equipment capable of providing the proper current pressure and timing values and controls to insure this. These values are entirely different today than they were considered to be ten years ago. At that time, as well as for the period dating from the time 40 years ago when the process first started to be commercially used, people wanted to see evidence of heat on the surface of a spot weld or they didn't consider it welded. One man, for instance (he was in charge of welding in a large plant, too), always contended the weld had to be actually "burned" to be good. Of course, we all know that such a weld is no good because the strength of the steel has been reduced through annealing and reduction in thickness.

After that period came an improvement best illustrated by the comments of another welding supervisor in another large plant who wanted his equipment much larger than generally used at that time, because — as he said:

"I don't want to cook the steel —

I just want to weld it."

Today, we go even further and make spot welds in light gauges, which show practically no heat on the outside surfaces and no indentation except a slight heat shrink — and that is the kind of a spot weld you need for porcelain enameling.

### Requirements for producing the right spot weld

Now, let us look at the requirements to produce such a weld. FIRST, the parts to be welded must be clean and must fit tightly together, and you should strive for perfection in these two things. Anything less will result in "spits", the small, red-hot particles which explode out from between the faying or inner contacting surfaces being welded. These will cause rough specks wherever they hit and stick; the spot itself will show a depression and the opening indicated between the faying surfaces will be a place for the pickle solution to lodge and then boil out under the enameling temperature, causing cracks and blisters in your enameled surface.

SECOND, it is necessary to use spot welding equipment that will provide the required amperage and pressure, with proper sequence and timing control. These requirements automatically rule out any foot-operated machines as unsatisfactory and require the use of mechanically or air-operated machines and weld timers and contactors.

To give you some idea of what is meant by adequate current—pressure and timing—glance at the accompa-

nying data table which gives a few typical specifications.

I think you will immediately perceive that the values in the table are much higher than your previous conceptions, unless you happen to have made very recent inquiry into the matter. Using these values, you will get a spot weld nugget of proper size to give optimum strength and a weld nugget with desirable characteristics.

There is one more elementary but important point that is still frequently ignored, and that is the center distances on welds.

We still see small brackets of the order of say  $\frac{3}{4}$ " square, material 16 gauge, with 2 spots  $\frac{1}{4}$ " to  $\frac{3}{8}$ " diameter showing. Actually both spots will not be welded. Only the first one will be good, and the second will be hardly more than attached. A good rule to follow here is that on 16 gauge and 14 gauge material thickness,  $\frac{3}{4}$ " C/C distance is minimum. On 20 gauge,  $\frac{1}{2}$ " C/C distance can be used but even here  $\frac{3}{4}$ " is better if you can possibly get it. Also, the edge of the spot weld should be at least one gauge thickness away from the edges of the material, and two gauge thickness is better.

### Projection welding

Projection welding is a relatively new development and presents the best and quickest way to make multiple welds, within certain limitations of area and number of welds. It also allows the use of a large flat point against one surface, which keeps the indentation to a minimum. For this

WELDING DATA TABLE

Gauge	Diameter	Weld force minimum	Weld strength minimum	Approx. diameter fused zone
20	$\frac{1}{4}$ "	500 lb.	920 lb.	0.19
18	$\frac{1}{4}$ "	650 lb.	1350 lb.	0.22
16	$\frac{1}{4}$ "	800 lb.	1850 lb.	0.25
14	$\frac{5}{16}$ "	1100 lb.	2700 lb.	0.29

reason, I think it is a "natural" for your industry, and I expect to see a great deal more projection welding used on certain types of assemblies. It is particularly valuable for attaching mounting lugs, nuts or bolts to the underside of flat surfaces and there are companies who commercially manufacture these items and who catalog pretty nearly every type used with the projections already made and ready for use.

Standards have been established for the diameter, height and shape of the projections and are given in the R.W.M.A. Resistance Welding Manual. In case you do not have a copy handy, a quick rule-of-thumb sched-

the first impulse evens off the tops of the projections and brings them all into contact.

#### Roll seam welding

Roll seam welding, or stitch welding as some people call it, while having a complete set of characteristics of its own, is nonetheless also fundamentally a spot welding process. Normally, one edge is lapped over the other edge — these edges can be on separate pieces or may be opposite edges of the same piece formed to make a cylinder. They are first pre-spot-tacked on about five or six inch centers and then seam welded at upwards to 150" per minute, depending

They should definitely be what their name implies — "tacking" welds and not full strength welds — rather on the "underdone" side so that the surface condition of the steel is such that the seam welding wheels will have no tendency to burn and pick up steel on the weld wheel surfaces.

Service engineers' reports indicate that the tendency referred to is frequently the cause of trouble and as a general rule insufficient attention is given to the pre-spot tacking operation. There is a natural tendency to slight it because it is an extra operation that all production engineers look upon as an evil, and one they would like to do away with altogether. But, experienced operators have found that this is the true foundation of successful mash seam welding with consequential lack of bubbles and, therefore, good porcelain enameling results.

Sometimes the shape and size of the item will permit gratification of the production engineers' desires and pre-spot tacking can be eliminated. This is when the parts can be clamped in a fixture that will hold them very tightly against the tendency to spread under the heavy pressure required for mash seam welding. Since the parts can not then roll over a lower wheel, a spline bar must be used for the lower electrode. This introduces some difficulties — one of the worst of which is the difference in the heat penetration on the surface against which the wheel contacts as compared with the surface resting against the spline bar. In the case of the wheel, you have a line contact which has virtually no area of contact, generates a high heat at this line and has no cooling effect on the material. In the case of the spline bar, you have a large surface area of contact, which diffuses the heat, and has a very great cooling effect. This heat unbalance results in the top piece being forged into the lower or cooler piece rather than the desired equal forging of one into the other. Since, to do this, the top piece gets much hotter than it should, gaseous pockets are formed which bubble up in the porcelain enameling operation.

Another suggestion I would like to



*Projection welding leaves a smooth surface on one side satisfactory for porcelain enameling without additional "finish" operations.*

ule is: Height 40% to 60% of gauge thickness. Diameter at base 2 to 3 times gauge thickness, using the highest values for the lighter gauges, starting with 18 gauge, and the lower values for heavier gauges up to 6 gauge. The projections should be button shaped and formed out — that is, not sheared by the punch.

Projection welding being but a variation of spot welding, the requirements are the same insofar as preparation of material and the equipment are concerned. One comment about the control equipment is pertinent, however, and that is — it is best to use pulsation type control, so that

upon the gauge of material, machine used and shape of the item. But this normal procedure must be varied considerably when seam welding for porcelain enameling. The lap must be eliminated and the mash type of seam weld used. The normal overlap of the edges of the material is reduced to not over .080" or .090" for stock thickness up to and including 18 gauge (.050") and .115" to .125" for stock thickness up to and including 16 gauge (.062") material SAE 1010 steel. The spot tack welds should be much closer — 2" or 2½" centers at most — and much care exercised in making these tacking welds.

make about mash seaming longitudinal seams, when the work is to be carried in a jig or guiding fixture of any nature, is that the center line of travel should be slightly out of alignment — with the axis of the weld wheel shafts thereby removing the tendency to create a cavity in the welding wheel faces when mash seam welding this type of joint.

#### **Welding speeds**

When mash seam welding prior to porcelain enameling, the speed of the weld wheel can not be as great as when the operation is just a regular joining operation — 60" per minute is maximum with safety, even on 20 gauge when the normal weld speed would be 150 I.P.M. for a lap weld and about 90" for an ordinary mash weld. If too great a speed is insisted upon, then the weld is not forged down the way it should be, necessitating a subsequent operation such as hammering or rolling — although, sometimes this operation can be performed at a cost so low that it pays to weld at the higher speed and perform the added operation.

As far as the control equipment required for mash seam welding is concerned, an ordinary tube contactor and heat control is satisfactory because no current interruptions are required beyond the natural interruption that occurs 120 times a second on 60 cycle current.

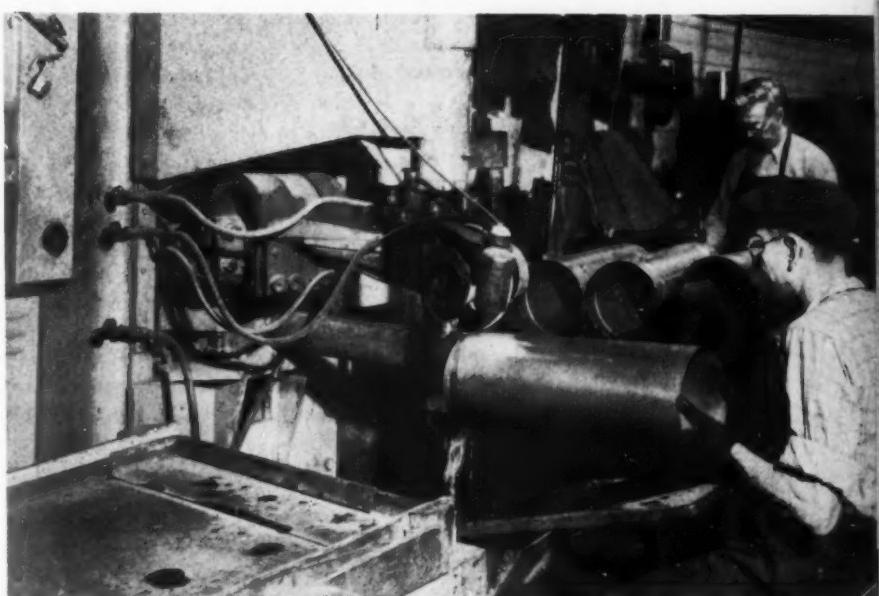
#### **Flash-butt seam welding**

The fourth and last type of resistance welding is the flash-butt type of seam welding. This is, of course, basically a very different operation because the material is edge to edge and barely in contact during the heating or flashing part of the operation; and then is forged together with current flowing only a very small part of the time — if at all — of the forging operation. The most important thing to watch is again the possible formation of gaseous pockets and subsequent bubbling. This has to do with the secondary voltage during the flashing operation. This voltage should be kept as low as possible, which will keep the flash particles small and keep pin holes in the weld

*to Page 52 →*



*Spot "tacking," an important operation preliminary to seam welding.*



*Mash-seam welding to approximately 1.25% of single thickness.*

*Hammering the seam to smooth "single thickness" for porcelain enameling.*



# A workable system

## for developing new products

presenting a product development system that has worked successfully for both wartime and peacetime products

By *Ralph F. Bisbee* • MANAGER, QUALITY CONTROL, WESTINGHOUSE ELECTRIC CORPORATION, MANSFIELD, OHIO

### PART II.

**I**N PART I (November *finish*) an outline of the Westinghouse system for developing new products was presented. Twelve steps in the sixteen-step program were covered. The outline included a description of the various committees and representatives, and their responsibilities in the program.

Part I closed with the assembly of verification samples for a new product, which, in this instance, is an electric range. The verification parts have been assembled under *regular production conditions*, so that all interested parties may become familiar with the assembly, and records have been kept of any discrepancies or troubles encountered.

#### Proving tests

Regardless of how efficient our process and quality control systems may be, it is impossible to find and stop *all* defects that may arise due to variations in material, assembly, welding, etc. For this reason, after many years of experience, our management has standardized on a final control of the finished product known as the *Quality Analysis Laboratory*.

Fundamentally, the Quality Analysis Laboratory and its associated procedures have been established as a control to protect our huge investment in completed apparatus and to guarantee our customers the very best product obtainable. This setup provides our sales department with a sound sales argument on high quality and provides factory management with a current check on the quality of completed apparatus prior to its release for sale.

The administration of the Quality

Analysis Laboratory is relatively inexpensive and shows a tremendous overall savings due to increased sales, better customer acceptance and the elimination of expense in making repairs to large stocks of completed apparatus which might be accumulated in our warehouses prior to receipt of customer complaints.

For example, on ranges, the system works as follows:

After the enameled ware has been assembled into the complete apparatus on the production line, and has been properly tested and inspected, it is sent to stock ready for shipment to the customer.

From each shift's work, two ranges are picked at random from the warehouse. They are sent to our Quality Analysis Laboratory where they are subjected to the transportation checks and operating tests.

#### Transportation tests

Regardless of how high the quality of any product may be, if it reaches its destination in a damaged condition all quality efforts have been in vain. Therefore, the first check made is to submit it to our transportation tests which consist of a Conbur Test and a Vibration Test.

Before we adopted the *Conbur Tester*, a porcelain enameled range verification sample was sent to the West Coast and returned. On inspection we found it was in excellent condition, and naturally we approved the design and the crating for the product.

It so happens that this particular test shipment had been handled very carefully and did not represent an average condition. It also happened that we had a weak design in one of

the door openings and, as a result, we had hundreds of the product built before the defect was found in the field and reported back to us. This caused us not only a lot of expense but created considerable trouble in the field.

The *Conbur Tester* would have detected this condition as the results are recorded on a shock recorder developed by the Association of American Railroads.

The shock recorder is a small instrument in a metal case which can be attached to a railroad car or any kind of product. The mechanism of this recorder is equipped with a delicate shock recording needle and records the shock on a paper tape which is graduated in five shock zones. When impact or shock occurs the needle draws an ink line on the chart, and, for example, if it is over the second zone the railroad informs us they will be responsible as this is abnormal handling.

But how are you going to determine if the shock is greater? In several test shipments used, recorders were installed in the cars to determine the average shock received in humping in railroad yards such as Chicago, and we found it exceeded the fourth zone. Therefore, all of our products must stand shock into the fifth zone, and if they do, we know the packing, crate, and product design and workmanship are safe to release for production.

The *Vibrator Test* is to determine if the crate and the product will stand vibration such as received in railroad cars with flat wheels or from rough roads when transporting by truck. Here's how it works:



The machine is adjusted to the intensity desired. (Machine runs at 2.26 cycles per minute.)

Estimated distances at this speed and with  $\frac{1}{4}$ " vibration are as follows:

$\frac{1}{2}$  hrs. operation parallels a trip by freight to Chicago.

1 hrs. operation parallels a trip by freight to St. Louis.

$1\frac{1}{2}$  hrs. operation parallels a trip by freight to Denver.

2 hrs. operation parallels a trip by freight to El Paso.

$2\frac{1}{2}$  hrs. operation parallels a trip by freight to Los Angeles.

If the product meets the transportation test, we know both the product and the crate are developed to a point where it will be received at its destination in good shape after we release it for production.

#### Inspection

The crates are then opened and minute inspection given to every part of the exterior and interior to determine: (a) Results of the transportation tests, and (b) Any other existing defects.

#### Customer use tests

The product is then rechecked electrically throughout and if found OK, it is placed on a continuous "heat

This refrigerator is being subjected to the Vibrator test, which determines whether the crate and product will withstand the most severe vibration which it may encounter while being transported by train or by truck.

on an unknown quantity of the product without this control.

As an example, on one enameled range we found that the enamel would break in the center of the side panel over an angle that held the bottom drawer. In checking back, we found that the welding buck was incorrect and caused a strain in the side panel. If this condition had not been found before production was released, many thousands of ranges would have been made up and a great many shipped and a product manufactured that would have reached the field defective.

This is just one of many defects of this kind that have been found and corrected.

STEP NO. 13 is a preliminary verification meeting at which the secretary calls on the representatives as outlined previously. At this meeting any discrepancies are carefully reviewed, production is released on all parts found to be satisfactory, and the chairman assigns interested individuals to correct any problems and discrepancies necessary. Each individual follows through to clear up his part of the problem in the shortest possible time so that the final verification meeting can be held. It is at this point where management's backing is needed most.

and cool" electrical test for seven days.

Over the years we have not found a single day when at least some minor troubles have not been found and traced back and corrected on the line, thereby immediately correcting the trouble which would have occurred

A crated electric range is being subjected to the transportation shock test developed by the Freight Container Bureau and the Association of American Railroads. It records the impact on a standard railroad shock recorder and provides an accurate method of pre-determining shock resistance of product and packing.





*View of the Quality Control Laboratory where simulated field tests are conducted, to parallel actual use conditions as nearly as possible.*

STEP NO. 14 is the *final verification meeting* at which complete minutes are recorded. These minutes include a review of the discrepancies outlined to be sure that they are cleared and that subsequent tests have found the product to be correct.

At this point a *final verification approval sheet* is signed by the works manager, the manager of engineering and the chairman of the verification committee. This approval sheet, along with other verification reports,

is filed in the Quality Control Office.

**STEP NO. 15** represents *standardization*. Standards are set on the first product based on costs in the same price class as competition.

STEP NO. 16 represents the *start of production.*

## **Standardization of quality control for porcelain enameling**

I wish to emphasize that Westinghouse has standardized on porcelain enamel quality control. We do not

expect to change it inasmuch as our results prove that the system is satisfactory and is based on actual experience rather than theory.

I also want to emphasize that standardization on just a few tests will not give the desired results as each step, from the raw material to the finished product shipped and accepted by the customer, must be completely standardized if the desired results are to be obtained.

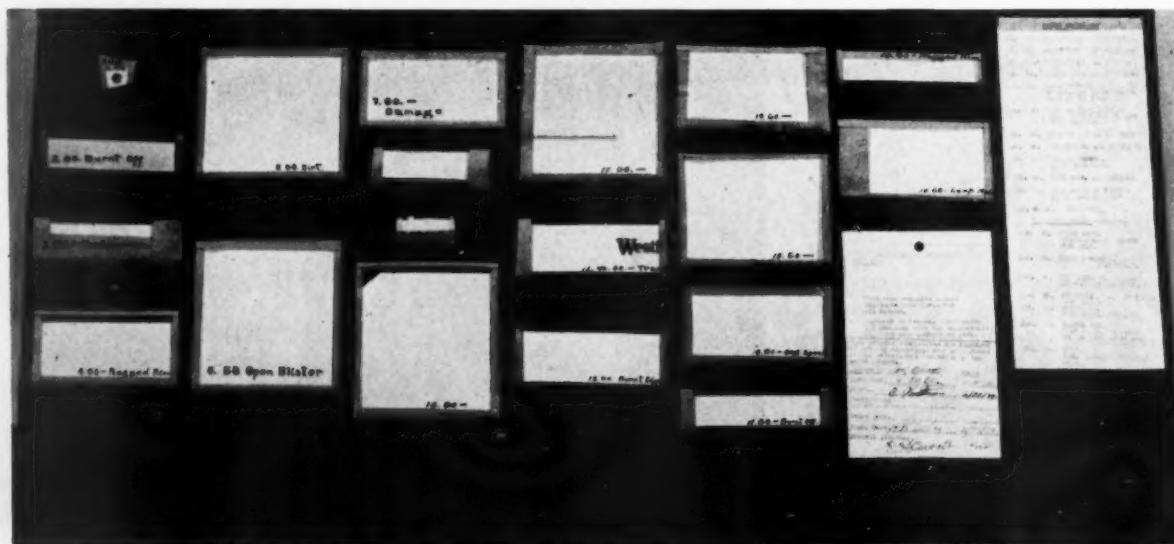
## Summary

In summarizing, the management of any business is judged on his organization's ability to *make money* and, at the same time, produce a *quality product*.

Regardless of how any system may be, it can not hope to be successful unless it has the whole-hearted backing of management. This system, with the proper follow-through and backing, can be applied to any type of product, and will result in:

1. *Less development* on the production line.
  2. *Increased production* at the start.
  3. *Higher quality* at the start.
  4. *Lower costs* at the start.
  5. *Complete understanding* between all interested departments.

*Standards exemplifying each type of maximum passable enameling defect are placed in a glass enclosed case and kept before the inspector in the "Tunnel-of-Light" inspection room at all times. A duplicate set is placed at the assembly line inspection station. This eliminates guessing and precludes the chance of passing ware at one station and rejecting it at another. Standards are stretched to the maximum limit on "slight" finish imperfections before rejecting the ware. This avoids adding an additional coat and insures the customer a more durable product.*



# The cost of high living

are all officials crooks or are they in the grip of forces stronger than themselves?

By Geoffrey F. Morgan • AUTHOR, EDUCATOR, LECTURER • SANTA MONICA, CALIFORNIA

BEGINNING in 1775, and ending in 1781, our forefathers fought and won a war based on the slogan, "Taxation without representation is tyranny." It was a good battle-cry, and served to rally men and money and munitions to the support of the cause. But that was 150 years ago, of course, and times have changed. Nowadays we have shortened that slogan, abridged it, given it added emphasis and punch, until today the average American simply says "Taxation is tyranny," and lets it go at that. This is no exaggeration; it is a simple statement of fact. The common man, seeing the constant rise in tax levels, and comparing the cost of government today with the lower rates of a generation ago, is pretty well convinced that he has fallen victim to some new species of injustice; that he is being oppressed and exploited, and that the time has come to resist, by force if need be, the constant levying of newer and higher taxes that takes place every year.

## The taxpayer's chart

He is encouraged in this by a variety of taxpayers' organizations, whose principal arguments are framed in the form of charts. These charts consist of jerky lines euphoniously known as curves, one of which represents the growth in population, and the other the rise in taxes. Theoretically, of course, the two should run more or less parallel, but actually the curve which represents increase of taxes mounts two and three times as fast as the line which represents increase of population. Such diagrams lend fresh strength to his conviction that taxation is a kind of tyranny which ought to be resented and resisted by every patriot American.

From one point of view of course the charts are entirely correct, since

tax levels have outrun population levels to a marked degree. The mistake which such charts make is to assume that the living standards of today are the same as those of forty years ago, which everybody knows is not the case.

Suppose we turn back to the year 1900 for a moment, just for the purpose of making some comparisons. In 1900 the fire department consisted of a few horse-drawn engines, manned by firemen who were far more competent as checker champions than they were as smoke-eaters. City streets were chiefly sand and gravel, and the passing sprinkling cart served only to spread a temporary wet blanket on the ever-present dust. Police protection was had in the figure of the village constable, who generally combined some civilian occupation with his official duties. The one-room school, to which distance lends a purely fictitious enchantment,

was a little place where a little girl taught little things to little children for a little time and a little money every year. Public libraries were hardly known outside the larger cities until the beneficence of Mr. Carnegie made them possible; parks and playgrounds were almost equally infrequent, and such modern matters as swimming pools, welfare centers, health inspection, and relief projects were simply non-existent. No wonder, the cost of government was so low!

## Shall we toss out the fire engine?

The real reason for the changes that have come in forty years has been the rise in the national standards of living. The fundamental fallacy of the opponents of the modern tax rate is their implied contention that the rise of the tax level should parallel the rise of the population level, which is obviously not the case. Of course it is entirely possible to go





back to the tax level of forty years ago, provided only that we will all go back to the living standards of forty years ago, but if we won't do one then we can't do the other. If we would only do away with the paved highway, the automotive fire-engine, the trained and motorized police force, the modern public school, together with the libraries, the parks and the playgrounds, the garbage disposal and the rubbish collection, the health service and the welfare work, then we could immediately do away with the cost of providing and maintaining these things.

#### " . . so I voted for Robinson"

I have been a voter during just the period under discussion, and during these last forty years I have seen a good many candidates and office-holders come and go. Almost without exception they have all campaigned on the same platform, "Economy in government." "Vote for Jones and lower taxes"; "Elect Smith and reduce the cost of government"; "Robinson stands for tax reduction." Well, sometimes I voted for Smith, and sometimes for Jones. Sometimes I knew both Smith and Jones, and so I voted for Robinson. But speaking in general terms I have seen the cost of government rise pretty steadily during all those same forty years. This must be due to either one of two factors. Either all these numerous

officials were crooks and liars who had no intention of carrying out their promises, or else they found, when once they were in office, that they were in the grip of forces stronger than themselves, and that they could not carry out their pledges if they would.

Speaking from my own experience as a public official, I would say that it is hopeless to try to reduce the cost of government, because the people who are governed won't stand for it. They think they will, of course. They are just as honest in demanding a reduction in the cost of government as the candidate was in promising to lower the taxes, but when it comes right down to cases, few men are willing to forego the service and the convenience which government provides them in this modern age.

#### The citizen speaks

Let's start with the police force. Why aren't the streets better patrolled? There is too much speeding on the boulevard; we ought to have more traffic officers. How about the schools? We ought to have more officers at the crossings. And speaking of the schools, the busses are badly overcrowded on our route. We ought to have bigger busses. Then too, we ought to have a new gymnasium. The neighboring town has just completed one; who are we to take second place to them? And what

about a dental clinic? That's another thing I'd like to see established in our schools.

Fire protection? We need a bigger engine. And I can't understand we don't have any adequate hook and ladder, either. Can you imagine? Is there any danger of the baby's suffocating? Send for the inhalator squad. These modern firemen certainly do know their stuff! As for the library, I don't see why they don't have more of the new books. I waited six months to read "Gone With The Wind," and now it looks as if I'd wait a year to read "Forever Amber." The gardener has been ill; he ought to go down to the clinic. Is this food safe? I'd like to know what we have a health department for? Where will the Twilight League baseball game be played? Why, on the municipal playground, of course — right next to the municipal swimming pool. And so it goes.

#### Suggested correction for a popular phrase

The minute some public official proposes to discontinue any one of these services, he is immediately threatened with recall, and sometimes by the same individuals that have been denouncing him for extravagance in office! For this reason, people who talk of lower taxes and reducing the cost of government should always be required to specify the exact type of service which they want discontinued. The sooner this is done, the sooner we shall stop confusing the *high cost of living* with the *cost of high living* which is the chief cause of our present agitation.

**I**f you have company news, personal items or any editorial information of interest to the porcelain enameling industry, be sure to send it in for the January issue of *Finish* — closing date December 10. The January number will be a special issue in celebration of the publication's "second anniversary."

THE EDITOR

# Porcelain enamel institute

## fourteenth annual meeting

FINISHPOTOS EXCLUSIVELY

A GREATLY expanded enameling industry resulting from broader uses of porcelain enamel as a finish was the expectation voiced by speakers and members in attendance at the 14th Annual Meeting of the Porcelain Enamel Institute held at the William Penn Hotel, Pittsburgh, on October 24 and 25.

The business meeting of the Board



Treasurer Hogenson looks over financial report

of Trustees was held on the morning of the 24th, and was followed by a luncheon at which Eldridge Haynes, publisher of *Modern Industry*, was the featured speaker. Mr. Haynes spoke of "day after tomorrow," referring to a time when complete reconversion is well in the background. He included in his talk an outline of export sales opportunities, import pos-

sibilities and foreign manufacturing opportunities for American companies.

### The annual meeting

The Annual Meeting of the Institute was called to order early in the afternoon of the 24th. Included was an address by R. H. Turk, Institute



Secretary Mackasek

president; a report by Edward Mackasek, the secretary; and a report by William Hogenson, Institute treasurer. All reported definite progress in the general Institute program for the current year, and the treasurer reported the Institute to be in sound financial condition.

In his address the president voiced

approval of the work of the Institute office and the committeemen in the following words:

"Those of us who have had the pleasure of seeing the Managing Director and his staff at work and witnessing the generous contribution of time, talent and zealous attention to responsibility on the part of our Committeemen, feel the Institute has pro-



President Turk voices his approval

vided, this year, returns that far outweigh the value of our subscriptions. It is apparent that most of the members have recognized this, because much of that which has been accomplished is the result of hearty and sincere cooperation of the members when they have been called upon.

"Though progress has been made,

to Page 30 →



Vice President Spencer



Vice President Penton



Vice President Barrows

*Circle: "Bob" Weaver, Ferro Enamel president, presiding as chairman of the session.*

*Right: "Ray" Johnson represents Ellwood City Iron and Wire Co., new member of the P.E.I.*



## SNAPSHOTS AT THE



*Above: "Bill" Wenning of Ceramic Color & Chemical gets a bit of the latest news from Burton Longwell, Republic Steel.*

*Above left: Erivite Corp., new Erie, Pa., enameling company, is well represented by David Morgensthafer, Rush Dale, Dan Wheeler and James Vicary.*



*Right: Intent on "something" are Bennett Chapple, Jr., U.S. Steel Corp. of Delaware, Earl Walbridge, Porcelain Metal Products — Pittsburgh, and James McCrory of O. Hommel.*

*Above: Ray Dadisman of Armco, and chairman of the Market Development Committee, caught in a studious pose.*



J. H. E. McMillan from Ingram-Richardson, Beaver Falls, snapped while the annual meeting was in progress.

Right: Bennett Chapple, Sr., Armco's "Old Ironmaster" and a staunch Institute supporter.

*Left: This strictly candid, and none too complimentary, snapshot shows Ray Coin, Ingram-Richardson of Indiana, registering genuine surprise as the photographer takes an unfair advantage.*



## INSTITUTE MEETING

FINISHFOTOS

Right: Among the representatives from Vitro Mfg. Co. were Theo. Leschner and Alfred Earl.

Below: Here we see three past presidents of the P.E.I.—Pierre McBride, Porcelain Metals—Louisville; "Bob" Calton, Tennessee Enamel; and "Bob" Weaver of Ferro.

Below: Floyd Wolesslage, Carnegie-Illinois Steel, presenting the report of the Market Research Committee. The report was lauded by the Institute membership.



→ from Page 27

the vast potentials that are clearly visible for 1946 and the years to come will not be ours just for the asking. It will require the continued hard work and intelligent management that distinguished the Industry's effort during the war. That the progress of the Institute shall keep step is both the work and the responsibility of each and every member."

#### Division reports

An answer to the question, "What will P.E.I. do in 1946?", was given in part by R. A. Weaver who presided as chairman for the Division reports, and was completed in detail in the committee reports.

Floyd Wolesslage, Carnegie-Illinois Steel Corp., presented an outstanding market study by the Market Research Committee entitled "Preview of Future Markets for Porcelain Enamelled Products." Chairman of this committee is R. J. Ritchey, Carnegie-Illinois Steel. This committee research report was acclaimed by the membership as an outstanding contribution to the industry's market information.

J. E. Hansen, Ferro Enamel Corp., outlined the program for the P.E.I. Forum in Columbus, Ohio. Chairman of the Forum Committee is F. E. Hodek, Jr., General Porcelain Enameling & Mfg. Co.

B. T. Sweely, Chicago Vitreous Enamel Product Co., read a detailed report prepared by Dr. G. H. Spencer-Strong of the Product Standards Committee.

P. B. McBride, Porcelain Metals Corporation and Institute past president, explained the proposed plan of

the Institute development committee for making the Institute an increasingly important factor in serving the needs of the industry.

H. R. Spencer, Erie Enameling Company, explained what the newly formed Architectural Division of the P.E.I. expects to do in the development of this specialized market.

#### OPA is represented

During the second day of the meeting Mr. Harvey O. Tenner, Chief, Household Furniture Section, Consumer Durable Goods Division, OPA, addressed the open session. He effectively presented a clarification of the requirements facing manufacturing groups in connection with the de-

#### P.E.I. MARKET RESEARCH COMMITTEE

R. J. Ritchey, Chairman.....	Carnegie-Illinois Steel Corp.
G. S. Blome, Vice Chairman.....	Baltimore Porcelain Steel Corp.
B. F. Birdwell.....	Porcelain Metals Corporation
J. F. Ingram.....	Ingram-Richardson Mfg. Co.
Edward Mackasek.....	Porcelain Enamel Institute
F. L. Meacham.....	Chicago Vitreous Enamel Product Co.
F. H. Ramage.....	Republic Steel Corporation
Herbert Turk.....	Pemco Corporation
N. G. Wedemeyer.....	Rohm & Haas Company
F. C. Wolesslage.....	Carnegie-Illinois Steel Corp.

R. A. Dadisman, American Rolling Mill Co., chairman of the Institute's Market Development Committee, reviewed the program activity for 1945 and presented plans for 1946.

#### Officers elected.

At the organization meeting of the new Board of Trustees, the following officers were elected for 1946:

President: R. H. Turk, Pemco Corporation.

Vice Presidents: H. R. Spencer, Erie Enameling Co.; W. A. Barrows, Barrows Porcelain Enamel Co.; and J. T. Penton, California Metal Enameling Co.

Treasurer: William Hogenson, Chicago Vitreous Enamel Product Co.

Secretary: Edward Mackasek, Porcelain Enamel Institute.

P. B. McBride serves as past president in the officers group.

termination of prices. His discussion should be quite helpful to the members in determining courses to follow in this regard.

Following the second day's general meeting individual meetings were held by the Architectural, Sign, Jobbing and Table Top groups, at which the specific problems facing each branch of the industry were discussed in detail.

#### A picture of industry expansion

Judging from the report of the Market Research Committee, porcelain enameler are about to embark on an era of unprecedented peacetime production as a result of expansion in domestic, commercial and industrial markets for porcelain enamel.

*At the speakers' table for the P.E.I. luncheon are Bennett Chapple, Sr.; Harold Downing, Walker & Downing; Elbridge Haynes, "Modern Industry"; Pres. Turk; Treas. Hogenson; and Past Presidents McBride, Calton and Weaver.*



## DOMESTIC HOUSEHOLD MARKETS

1946

4400 MILES OF PORCELAIN ENAMEL

Opportunities.



### Preview of the future market for porcelain enamel

adapted for Finish from the report of the Porcelain Enameled Institute  
Market Research Committee, as presented at the 14th Annual Meeting.

By Floyd C. Woestagle • ACTING CHAIRMAN, MARKET RESEARCH COMMITTEE

PREDICTING can never be an exact science and this applies particularly to the period ahead that appears to be cloaked with many uncertainties. Nevertheless, there are certain basic elements in the outlook that strongly support a substantial potential market for porcelain enamel products. In the domestic or household markets alone, 4400 miles of porcelain enamel opportunities are open for development in 1946, according to a study made by the Market Research Committee of the Porcelain Enamel Institute. In a close appraisal of this market, quite naturally they foresee a higher level of activity in subsequent years when porcelain enamel products are ex-

pected to be sought in quantities that would be sufficient to cover a 22 foot highway 6700 miles long.

Before the basic elements of each market were studied, the reasons for the manufacturer's, retailer's, and user's acceptance of porcelain enamel were considered. Recognition of the importance of these decisions led to an evaluation of the attributes of porcelain enamel in each end-use product where the material had been successfully used in the past or where new prospective applications were apparent. When this grading process was complete, three roads were identified over which one may travel on to the future markets — one leading to domestic or household markets, one

to commercial markets and one to industrial markets.

#### The domestic market

The path through the domestic or household market was lined with 35,000,000 families in 1940 and the new family formations will expand the figure to at least 40,000,000 by 1950. New prospects crowd the roadway with a tremendous number of wartime newlyweds who haven't set up in housekeeping and the future marriages that are contemplated at the usual rate, add about 1,400,000 per year. Still other new prospects arise from building broader use of electricity and gas and by setting up new users. Squeezed among these new

SUMMARY OF FUTURE OPPORTUNITIES ESTIMATED  
FOR COMMERCIAL (MARKETING & SERVICE) MARKETS \*

TABLE NO. II	SURFACE AREA OPPORTUNITY FOR PORCELAIN ENAMEL (MILLIONS OF SQ. FT.)		ENAMELING STEEL REQUIREMENTS (THOUSANDS OF TONS)	
	1946	YEARLY AVE. 1947 - 1950	1946	YEARLY AVE. 1947 - 1950
RESTAURANT EQUIPMENT	8.0	12.0	11.0	16.0
HOTEL (PLUMBING & KITCHEN EQUIP.)	2.0	3.0	3.0	4.0
HOSPITAL EQUIPMENT	8.0	8.0	10.0	10.0
COMMERCIAL REFRIGERATION	15.0	20.0	22.0	29.0
FOOD BINS	8.0	12.0	8.0	12.0
FOOD STORAGE LOCKERS	1.0	2.0	1.0	2.0
COMMERCIAL LIGHT REFLECTORS	15.0	20.0	15.0	20.0
AIR MARKERS	5.0	10.0	5.0	10.0
COMMERCIAL SIGNS	10.0	20.0	20.0	50.0
STORE FRONTS	20.0	40.0	40.0	100.0
GRAVE VAULTS	9.0	18.0	42.0	84.0
TOTAL	101.0	165.0	177.0	337.0

\* EXCLUDES BUILDINGS.

markets are the sizable number of customers waiting to replace obsolete and irreparable household appliances.

On this road map it was found that, for *domestic refrigerators*, delayed and normal replacements plus marriages during wartime and normal times reflect the market picture shown in Chart I, which reveals 3½ million refrigerators to meet the needs for 1946 and 5 million refrigerators as the average per year for the following six years. In other words, it would mean 91 million square feet of porcelain enamel in 1946 or 105 thousand tons of enameling sheet steel.

For *domestic cooking ranges*, signs point to 3 million units in 1946 and 4 million units as the average per year for 6 years beginning with 1947. Translating these figures into porce-

lain enamel, it would mean 145 million square feet of porcelain enamel in 1946 or 261 thousand tons of enameling sheet steel.

This market is characterized by the kind of fuel used for cooking. For instance, families use fuel as follows: wood — 8,000,000; city gas — 17,500,000; oil or kerosene — 3,500,000; electricity — 3,200,000; coke or coal — 4,000,000. Replacement turnover for ranges may be accelerated by converting families to the use of another cooking fuel and by design changes and improvements.

An analysis of the *washing machine* market discloses that a large

NOTE:

- (A) Includes 10% penetration of market for exteriors
- (B) Represents 70% penetration of market
- (C) Represents 20% penetration of market
- (D) Represents 50% penetration of market

percentage of families use commercial laundry service and cannot be expected to buy washers. This is one of the reasons why only 13,400,000 families or about 50% of the users of electricity have electric washing machines. Based upon the committee's analysis, the market for 1946 is estimated to be 2,200,000 washing machines and then it is expected to skyrocket to 4,000,000 units per year for a 4 year period.

Construction of new homes and the remodeling and modernizing of residences create additional future markets for other household items made of porcelain enamel. *Kitchen sink* needs are expected to be as follows: 1,350,000 in 1946; 2,000,000 in 1947; and 1,825,000 in 1948. The need for *table tops* is expected to reach well over 1,000,000 units for several years to provide for setting up accumulated wartime newlyweds in housekeeping.

The average annual need for other types of household appliances during 1946-51 will be as follows: *gas-heating stoves* — 1,100,000; *electric-heating stoves* — 2,100,000; *oil heaters* — 600,000; *coal and wood stoves* — 2,500,000.

The *water heater tank* business is expected to burst forth with a volume of 2,000,000 units in 1946 and 2,700,000 units average per year 1947-1954. The market for *bathubs* is expected to call for 825,000 in 1946 and then double that amount in 1947. The

to Page 42 →

TABLE NO. I

TABLE NO. I	ESTIMATED FUTURE PRODUCTION (MILLIONS OF UNITS)		SURFACE AREA OPPORTUNITY FOR PORCELAIN ENAMEL (MILLIONS OF SQ. FEET)		ENAMELING SHEET STEEL REQUIREMENTS (THOUSANDS OF TONS)	
	1946	YEARLY AVE. 1947-1952	1946	YEARLY AVE. 1947-1952	1946	YEARLY AVE. 1947-1952
FOOD STORAGE						
REFRIGERATORS	3.5	5.2	91.0 (A)	135.2 (A)	105.0 (A)	156.0 (A)
FOOD PREPARATION						
COOKING RANGES	2.9	4.2	145.0	210.0	261.0	378.0
FOOD HANDLING						
KITCHEN SINKS	1.4	1.7	8.4	10.2	24.5 (B)	29.8 (B)
TABLE TOPS (PORCELAIN ENAMEL)	0.5	1.0	5.0	10.0	7.5	15.0
LAUNDRY						
WASHING MACHINES	2.2	3.2	55.0	80.0	38.5 (B)	56.0 (B)
UTILITIES						
SPACE HEATERS	3.8	6.7	114.0	201.0	17.0 (C)	33.5 (C)
WATER HEATER TANKS	2.0	2.7	36.0	48.6	14.0 (C)	18.9 (C)
BATHROOM FIXTURES						
BATHTUBS	0.8	1.3	32.0	52.0	30.5 (D)	52.0 (D)
LAVATORIES	1.0	1.5	8.0	12.0	7.5 (D)	11.2 (D)
MEDICINE CABINETS	1.0	1.5	7.0	10.5	7.5 (D)	11.2 (D)
SHOWER CABINETS	0.05	0.1	2.8	5.6	1.0 (C)	2.0 (C)
TOTALS:						
1. MARKETING PRODUCTS	19.15	29.1				
2. PRODUCTION OPPORTUNITIES FOR FRIT & PORCELAIN ENMLD. SHTS.			504.2	775.1		
3. PURCHASE OF ENAMELING SHEET STEEL FOR ANTICIPATED PENETRATION OF MARKET					514.0	763.6

# MARKET FOR DOMESTIC ELECTRIC REFRIGERATORS

PORCELAIN ENAMEL INSTITUTE

MARKET RESEARCH COMMITTEE

THESE FIGURES



REFLECT THIS MARKET

SALE OF DOMESTIC ELECTRIC REFRIGERATORS <sup>(1)</sup>								
DELAYED REPLACEMENTS BILLIONS OF UNITS		1.1 1933	1.4 1934	1.6 1935			DELAYED REPLACEMENTS BILLIONS OF UNITS	
	NORMAL REPLACEMENTS 1936	2.1 1937	2.4 1938	1.3 1939	2.0 1940	2.7 1941	3.6 1942	0.5 1942
MARRIAGES <sup>(2)</sup>								
WAR MARRIAGE RATE BILLIONS OF UNITS		1.8 1942	1.6 1943	1.5 1944	1.5 1945		WAR MARRIAGE RATE BILLIONS OF UNITS	
	NORMAL MARRIAGE RATE 1946	1.4 1947	1.4 1948	1.4 1949	1.4 1950	1.4 1951	1.4 1952	1.4 1952

FUTURE DEMAND FOR DOMESTIC ELECTRIC REFRIGERATORS

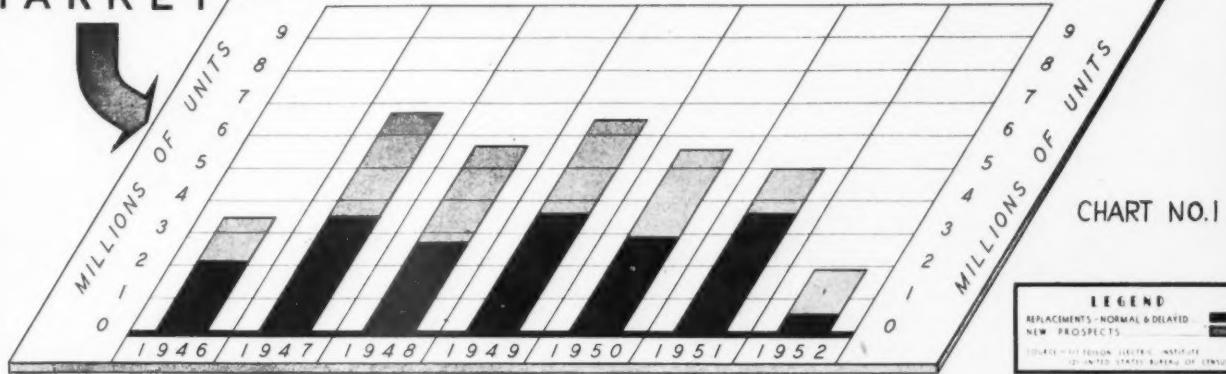


CHART NO.1

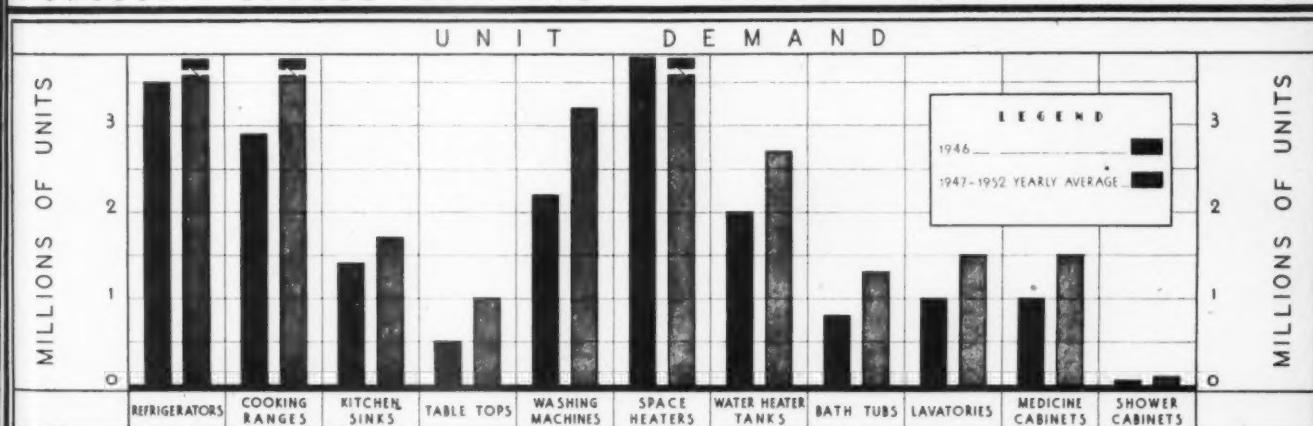
LEGEND  
REPLACEMENTS-NORMAL & DELAYED  
NEW PROSPECTS  
WAR MARRIAGE RATE  
SOURCE-PORCELAIN ENAMEL INSTITUTE  
UNITED STATES BUREAU OF CENSUS

CHART NO.1

## DOMESTIC HOUSEHOLD MARKETS SUMMARY OF FUTURE DEMANDS

PORCELAIN ENAMEL INSTITUTE

MARKET RESEARCH COMMITTEE



LEGEND  
1946  
1947-1952 YEARLY AVERAGE

MILLIONS OF UNITS

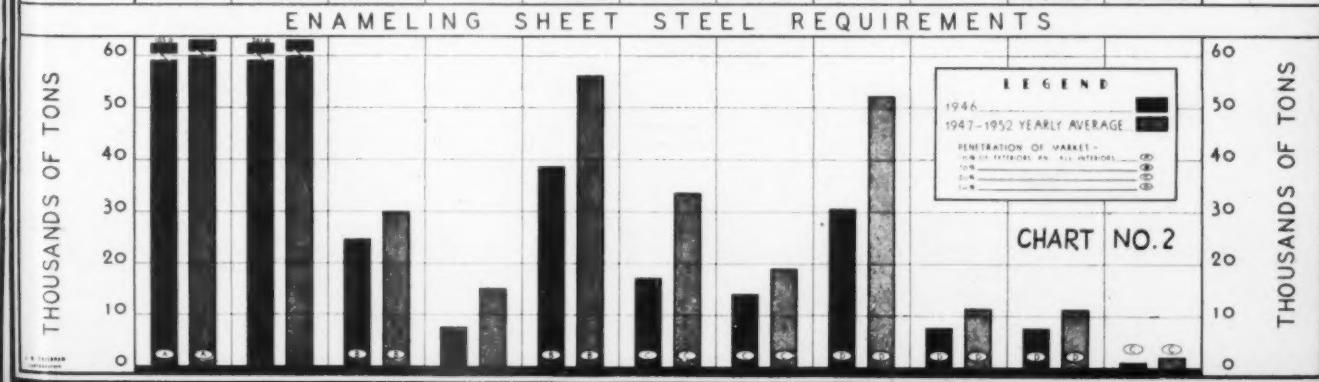


CHART NO.2

THOUSANDS OF TONS

Peace or  
War



"Lest We Forget"

# On Earth Good Will Toward Men

LL

COURAGEOUSLY WE APPROACH THE  
NEW YEAR STRONG IN OUR FAITH  
IN OUR FELLOW MEN AND SINCERE  
IN OUR WISH THAT WE MAY BE  
PERMITTED TO ADD SOMETHING TO  
YOUR HAPPINESS AND PROSPERITY  
DURING THE YEAR 1946 . . .

PEMCO CORPORATION





*Left: Henry Oesterle of Roesch Enamel Range; A. H. Daumke, Harshaw Chemical Co., and N. P. Fecht of Roesch. Right: "Bob" Foraker of Ingersoll Steel Division, Borg-Warner Corp.; "Bart" Fennesy of O. Hommel Company, and A. I. Rollins, McCray Refrigerator Co.*

## SNAPSHOTS FROM THE CHICAGO CLUB

REPORTED IN  
NOVEMBER finish



*Left: Fred Rozene of American Stove, Harvey, discusses the situation with Paul Gerdes (left) of A. J. Lindemann-Hoverson. The subject may or may not be porcelain enameling.*

*Right: Wesley Martin of A. O. Smith has lunch with Ralph Cook of the University of Illinois. Dr. Cook just returned from a mission overseas. Martin has a new "farm equipment" item of porcelain enameled steel.*

FINISHFOTOS



*Left: Edison General Electric Appliance Co. is well represented by L. F. Berg, S. A. Oakley and T. H. Swisher. Right: Don Beal of Youngstown Sheet & Tube, and Bill Noble of Ferro are interested in "something"; Cliff Andrews, at the time of the picture with U. of I. and now with the International Division of Ferro, intent on his soup; and F. A. Petersen, U. of I., "looks in."*

# NEWS

## Porcelain plays atom bomb part

Payne-Mahoney, Oakland, California enamelers, have just received from the University of California Radiation Laboratories (home of the Cyclotron) a citation for having played a part in the development of the atomic bomb.

Although the precise part played is not being talked about even now, it may be mentioned that the porcelain enamel application was in connection with the research end of equipment used by the production plants. Payne-Mahoney made hundreds of the "parts" during the war years. It is possible that they participated in production as well as research in connection with atomic energy.

Denis Mahoney, active partner in the enameling plant, is proud of the citation, and also of the fact that his war work was in the porcelain enamel field.

**Finish** is pleased to tell of the arrival of seven-pound Nancy Ann Hurd on October 22. The proud father, John M. Hurd, is associated with Ingram-Richardson Manufacturing Co. of Indiana, Frankfort, Ind.

A recent visitor at *finish* offices was Major J. B. Vernetti who, before the war, was connected with the enameling plant at Kalamazoo Stove

Company. Major Vernetti, a ceramic engineering graduate from the University of Illinois, class of '38, has been in the services of the A.A.F. since March, 1941. He is now on terminal leave.

## Orefraction advances Jack Hunt



The Board of Directors of Orefraction, Inc., has elected Jack Hunt vice president and general manager.

Mr. Hunt has been manager of Orefraction for the past twenty months. He will make his headquarters in Pittsburgh and will supervise the manufacture and sales promotion of the company's products which include Zircon, Rutile and Ilmenite.

Formerly and for eight years with Titanium Alloy Manufacturing Com-

pany as a field development engineer; for two years with Mullins Manufacturing Company as a ceramic engineer; and previous to that a staff man at General Electric Company, Mr. Hunt has had wide experience in the ceramic field.

He is a graduate of Ohio State University, holding degrees of Bachelor, Ceramic Engineering and Professional Ceramic Engineer.

## Gates to Pemco research staff

The Pemco Corporation has announced the addition of R. Wayne Gates to their Research and Development staff. Mr. Gates graduated in 1940 from the University of Illinois with a M.S. in Ceramics. He entered the army in 1940 and was honorably discharged with a 2nd Lieutenant's rating.

The Potter Instrument Company, Flushing, New York, designers and manufacturers of high speed electronic counting control equipment, announce the appointment of N. A. Moerman as their new sales engineer. For the past six and one-half years Mr. Moerman was employed at the Aberdeen Proving Grounds, Maryland.

## Staff appointments at U. of I.

W. D. Fitzpatrick, B.S. in Ceramic Engineering in 1941 at the University of Illinois, has recently been appointed as an Assistant to give instruction in the Department of Ceramic Engineering. Upon graduation in 1941 he was commissioned in the Navy, where he attained the rank of Lieutenant. Upon his release in September he joined the U. of I. staff.

A. W. Allen has been appointed Special Research Associate in the Department of Ceramic Engineering on an Army Air Force project concerning research development and application of ceramics in the aircraft field. He received the B.S. in Ceramic Engineering in 1941 from the Missouri School of Mines and Metallurgy, and the M.S. in Ceramic Engineering in 1942 from the Virginia Polytechnic Institute.

nic Institute. He was later with the Harbison-Walker Refractories Company. During the war he was a Navigator and Meteorologist in the Air Corps.

**Bassler speaks on welding**



FINISHFOTO

This photo of Clyde G. Bassler, district manager, The Taylor Winfield Corporation, was taken at the recent Chicago District Enameler's Club meeting where he talked before the group on the subject of welding. Read his welding problems discussion starting on page 19 of this issue.

**Westinghouse expands production capacity**

Manufacturing facilities in "practically every division" of the Westinghouse Electric Corporation "are being expanded to increase production from 40 to 50 per cent above pre-war level," A. W. Robertson, chairman, disclosed at a recent meeting of the Board of Directors.

At the same time Mr. Robertson emphasized that, despite the unusually good market for products the company manufactures and the fact that Westinghouse "is in the best condition it has ever been," he could not describe the profit outlook as being bright.

"With OPA opposing advances in the selling prices of our products, and with labor insisting upon increases," he said, "it is difficult to estimate profits from operations. The

management is deeply concerned over the possibility of run-away inflation which threatens the country. But if the national government orders an increase in wages, there will be no escape but to increase the prices of manufactured products."

**New Pemco color plant to triple prewar production**

Pemco Corporation, Baltimore, Md., announces that it has more than tripled its prewar facilities devoted exclusively to the production of colors for the porcelain enameling industry as well as for other ceramic uses. In commenting on these developments, Mr. Harold Wolfram, works manager, said, "The importance of color in almost every industry is being recognized to a greater extent each day. In the new electric kitchens; in bathrooms; on kitchenware; in tiling and glassware the trend is definitely to color and more color."

The color plant has been expanded and the laboratory staff implemented in the light of this trend, according to Mr. Wolfram. Production for the enameling industry will center around sixteen "basic colors" according to the report.

**Fred Lammert dies**

Fred H. Lammert, special representative of The Youngstown Sheet and Tube Company, connected with the Indianapolis, Indiana district office for the past ten years, died suddenly from a heart condition at Cleveland, Ohio, on Sunday, October 21.

Wm. Damerel is now sales manager for Seaporcel Porcelain Metals, Inc., Long Island City. Mr. Damerel was formerly with Maxim Silencer Co., and with Burgess Battery Company's acoustical division; also, Sperry Products Co., Inc.

**"Cliff" Andrews to Ferro-International**

C. M. (Cliff) Andrews has recently left the Department of Ceramic Engineering, University of Illinois, to accept a position with the Interna-

tional Division of the Ferro Enamel Corp. After receiving the B.S. degree in Ceramics in 1934 he has had extensive experience in the field of porcelain enamels, having been associated with the Altorfer Brothers Company at Peoria, Illinois; the Ingersoll Steel Division, Borg-Warner Corp., Chicago, Illinois; the McCray Refrigerator Company, Kendallville, Indiana; and recently with the Department of Ceramic Engineering, U. of I., on the development of special ceramic coatings on an Army Air Forces project.

**Philco names refrigerator production manager**



**Company will double 1941 production**

William J. Peltz has been named general production manager of the Refrigerator Division of Philco Corporation, it was announced by W. Paul Jones, vice president in charge of the Division.

Mr. Peltz joined Philco in 1925. From 1936 to 1942 he was Industrial Engineer of the Radio Division and since that time has been production manager of that Division. Philco says he will assist Edward F. Theis, vice president in charge of refrigerator production, in carrying forward company plans to *more than double 1941 output*.

F. M. Mitchell, director, Consumers Durable Goods Division, War Production Board, Washington, D.C., resigned his position with the WPB

effective October 31, and returned to the Frigidaire Division, General Motors Corp., Dayton, Ohio, on November 1, in the capacity of manager of Laundry Equipment Sales, H. M. Kelley, Appliance sales manager of Frigidaire, announced.

A. Gordon Wootton, former Chief of Refrigeration and Air Conditioning Section, Special Equipment Branch, General Industrial Equipment Division, WPB, has returned to the Seeger-Sunbeam Corp., manufacturers of commercial refrigeration.

#### American Central states pricing policy

New all-steel kitchen sinks and cabinets manufactured by American Central Manufacturing Corporation, Connersville, Indiana, will cost no more than prewar models, it was announced by C. Fred Hastings, general sales manager.

The Connersville concern, Hastings added, has practically completed the necessary reconversion of its plant facilities. The plant should be in production on household equipment before this issue of *finish* goes to press.

#### Frigidaire adds complete line of refrigerated cases

E. R. Godfrey, general manager of the Frigidaire Division, General Motors Corp., Dayton, Ohio, announced that Frigidaire has added a complete line of refrigerated cases and fixtures to its commercial refrigeration products.

At present six models of reach-in refrigerators are planned and will be available to the public in December. They include the 20, 30, 50 and 60 cubic foot models with forced air cooling units, and the 20 and 30 cubic foot models with ice making cooling units.

The Frigidaire cases will be initially available in ten styles and sizes after January 1. Display cases of the single-duty type will be manufactured in 10 and 12 foot lengths; while double-duty cases will be available in 6, 8, 10 and 12 foot lengths. A 6 foot length, full vision case for

dairy and delicatessen usage will also be made; as will a double-duty vegetable case in an 8 foot length, says the report.

The *inside* of the *reach-in refrigerators* will be finished in *porcelain*, while the exterior will be baked white enamel.

The *walk-in coolers* will be avail-

able in both *porcelain* and baked white enamel *both exterior and interior*. Three styles of *refrigerated cases* will be finished in *porcelain inside and out*, and seven styles of cases will be part enamel and part baked white enamel through both the interior and exterior.

#### Harshaw wins award for work on atomic bomb chemicals



A four-star Army-Navy "E" flag has been awarded by the Manhattan Engineer District to the 640 employees of the Harshaw Chemical Company Cleveland plant and office in recognition of the research, development and production work done by the company on several different chemicals essential to the atomic bomb.

Of the twenty awards being given to companies throughout the country by the Manhattan District, Harshaw is the only company receiving this official recognition in Ohio for high achievement, it is reported.

The four-star award Harshaw received is one of only two being awarded in the entire country.

The "E" flag with four stars is equivalent to having won the award each six months for the past two and one-half years. Actually, it is said, Harshaw had been actively engaged in certain phases of research designed to release the energy of the atom in modern warfare before the Manhattan Project had officially taken shape.

The strict secrecy imposed on the work prevented this special award from being made until security regulations were released recently.

Keith B. Miller, sales manager of the Tappan Stove Company, Mansfield, Ohio, has announced the appointment of Donald S. Sharp, director of retail sales training, as assistant sales manager.

#### Pennsylvania Salt's Horatio Alger man

Warner R. Over has recently been named treasurer of the Pennsylvania Salt Manufacturing Co.

Mr. Over joined Pennsylvania Salt

as a clerk in 1904, was appointed secretary of the company in 1940, and now assumes his new duties as treasurer.

It has been reported that Ed Adams has resigned his position at Erie Enameling Company to join the Erieite Corporation of Erie, Pa. Mr. Adams was formerly with Roberts and Mander Stove Company, Hatboro, Pa.

Gordon Lasiter, formerly with Co-

Operative Enameling Co., Cleveland, is said to have taken over Mr. Adams' duties at Erie Enameling.

**Bill Paquin joins O. Hommel**



Wilfred M. (Bill) Paquin, for four years with Norge Division, Borg-Warner Corporation, at its porcelain enameling plant in Muskegon, Mich., on control and production, and for the past four years with Quaker Chemical Company on sales and engineering work, has joined the sales and service organization of the O. Hommel Company, Pittsburgh. Mr. Paquin is a graduate ceramic engineer with a B.S. degree from Alfred University, following which he spent a year with Ferro Enamel Corporation, Cleveland, on porcelain enamel research.

**Lindberg to Federal Electric**

Word comes to *finish* that August Lindberg has joined Federal Electric Company, Chicago, as enamel plant superintendent. His enameling experience includes work at A. J. Lindemann & Hoverson Co., Milwaukee, Wis., and as supervisor at Kelvinator Division, Grand Rapids, Mich. He has also had a number of years' experience in other branches of the ceramic industry. During the war he was production engineer at Dodge-Chrysler Corp., Chicago.

Harry Ambright, eastern sales manager for American Central Mfg. Corp. since early in 1944, moves to

Connersville to head a newly-created contract Kitchen Equipment department.

**Veterans return to Locke Insulator**

Lt. Commander Carl Forsythe of the U. S. Coast Guard and Major John Mangold of the U. S. Army have returned to the Locke Insulator Corp., Baltimore, Md., from which they have been on a leave of absence since 1941.

**George Wright to O. Hommel**

George Wright is now associated with the O. Hommel Company of Pittsburgh as a service and sales engineer. Mr. Wright has been associated with the industry for nearly 50 years. He received his early training in the industry with the McClary Manufacturing Company, now General Steel Wares, Ltd. During 17 years connection with the McClary organization he became acquainted with enameling problems.

His next position was with the Bellevue Porcelain Enameling Company as assistant superintendent. Since that time he has also been associated with the Ohio Valley Enameling Company and the Buck Stove and Range Co. in St. Louis. For the past 18 years he has been doing sales and service work in the porcelain enameling industry, in both the United States and Mexico.

**U.S. Steel executive commends delayed-retirement workers**

Benjamin F. Fairless, president of United States Steel, expressed appreciation for the wartime service of veteran steelmakers, who worked beyond retirement age to help meet military needs, in these words:

"The efforts of some 4,500 of the employees of U. S. Steel, who elected to work past their normal retirement age, was one of the outstanding contributions to the success of the war program of the Corporation and its subsidiaries. During a time of severe manpower shortage, when our plants, mines and shipyards were straining to produce the maximum amount of war materials, their skill and know-how were an important

factor in producing record tonnages. We are proud of their response during the time of our country's need."

Carnegie-Illinois Steel Corporation, U. S. Steel subsidiary, is honoring the veterans with a citation for meritorious service, which is awarded to each at the time of actual retirement.

**Chapman new manager of sales Carnegie-Illinois, sheet division**

Thomas J. Hilliard, vice president in charge of sales of Carnegie-Illinois Steel Corp., announced the appointment of Marcus M. Chapman as manager of sales, sheet division. He succeeds Howard V. Clark, who recently resigned from this U. S. Steel subsidiary.

**Coffeen joins M.&T. research staff**



William W. Coffeen has recently joined the Research Staff of Metal & Thermit Corporation. He is located at the company's Ceramic Laboratory at Carteret, New Jersey, where it is reported extensive expansion has been made in laboratory space and equipment.

Mr. Coffeen is a graduate of the University of Illinois and has the degree of Master of Science in Ceramic Engineering. He was also a Research Associate at the U. of I. Engineering Experiment Station under the direction of Professor A. I. Andrews. From 1937 to 1939 he was Ceramic Engineer for the Canton Stamping & Enameling Co. at Canton, Ohio.

*to Page 44* →



and



**economically supplies  
the qualities that  
COUNT...**

Customers stay satisfied when you use LUFAX-opacified enamels. You can count on their truer, white color and greater durability... already proved in service on countless household and industrial applications... to bring you a steady flow of orders. And with LUFAX, these qualities can be imparted at low cost.

Several different types of LUFAX zirconium compounds are available to meet the requirements of various enamels and their applications.

**LUFAX 20 A and 20 B:** For use in porcelain enamels where high opacity and gloss are important. Most satisfactory for all-round applications, including opaque, super opaque and antimony-free enamels.

**LUFAX 435:** Develops extremely high opacity in both antimony and antimony-free enamels. Most effective for enamels requiring the highest opacity at lowest cost.

**LUFAX 500:** Especially effective for use in acid-resisting enamels to develop high opacity and gloss without sacrificing acid resistance.

#### **INCREASED OPACITY**

#### **RESISTANCE TO CHIPPING**

#### **DURABILITY**

#### **COLOR STABILITY**

#### **UNIFORMITY**

*LUFAX is a trade-mark, Reg. U. S. Pat. Off.*

Represented by Cia. Rohm y Haas, Carlos Pellegrini 331, Buenos Aires, Argentina, and agents in principal South American cities.

**ROHM & HAAS COMPANY**

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

Manufacturers of Chemicals including Opacifiers Plastics Synthetic Insecticides Fungicides Enzymes Chemicals for the Leather, Textile, Rubber and other Industries



## Preview of the future market for porcelain enamel!

(Continued from Page 32)

demand for *lavatories* points to 1,000,000 for 1946 and 2,000,000 for 1947. *Medicine cabinets* of the better grades should roll off the production line at the same rate.

A summary of the future demands in the Domestic Household Markets is shown on Chart 2 and Table I.

### The commercial and "service" market

In the *commercial (marketing and service) field* the following needs were described: For *restaurants* some of the equipment needs for 1946 are: Cafeteria Counters ..... 5,000 Coffee Urns ..... 10,000 Metal Top Kitchen Tables ..... 10,000 Hoods for Ranges ..... 2,600 Hot Water Heaters ..... 5,200 Metal Shelving ..... 15,000 Ranges ..... 10,000 Ovens ..... 5,000 Sinks ..... 10,000 Steam Tables ..... 7,000 Toasters ..... 13,000 Frozen Food Storage Equipment ..... 6,000

*Commercial refrigeration* in 1946 is expected to bring calls for mechanical units as follows:

40,000 ..... Beverage Coolers  
50,000 ..... Ice Cream Cabinets  
23,000 ..... Water Coolers  
35,000 ..... Display and Storage Cases  
20,000 ..... Refrigerator Cases

There also will be ice-using Refrigerators, Water Coolers, Milk Coolers, and Food Display Cases needed in as many as 125,000 units.

In the *automotive field* 60,000 auto stores and 240,000 gasoline filling stations spotted along our roads and city streets represent the source for nearly 100,000 signs, at least 25% of which may be porcelain enamel.

Name changes alone will bring about many of these demands for new identification signs.

*Hospitals* will require 200,000 beds and accompanying auxiliary facilities for several years to meet new and replacement needs.

*Hotels* need plumbing, kitchen

equipment, and elevators for their modernization program.

*Theaters*, of which there are 16,000, need 8,000 directional and exit signs and 5,000 fire extinguishers; and 1,000 new theaters are expected to be built in the next two or three years.

*Off the Street Parking Structures* open a new avenue for porcelain enamel. Some of the traffic problems in metropolitan areas will be solved by erecting these buildings.

*Aviation markets* are open for 100,000 air markers. Many of the 3,000 airports will build additional buildings to handle increased traffic. About  $\frac{1}{2}$  of existing fields are expected to be improved and 3,000 additional fields built. Here is a need for boundary cones and markers.

*Summarizing the Commercial (Marketing and Service) Markets:* Opportunities offer a need for at least 900 miles of porcelain enamel. Table II shows the surface area opportunities for porcelain enamel in some of the commercial markets.

### The industrial market

Turning to *industrial markets* we find the need for plant sanitation facilities. Many small plants are without drinking fountains, and 50% do not have hot water in lavatories.

These are only a few of the many opportunities in the industrial field.

In the *Dairy Industry* many applications are presented where broad acceptance for porcelain enamel is indicated.

An outside estimated inventory of equipment reveals that many facilities are over 10 years old. Some of the equipment that is listed to be over 10 years old is:

#### In Ice Cream Establishments:

3,000 Storage Tanks  
6,000 Pasteurizers  
4,000 Coolers  
5,000 Batch Freezers  
5,000 Sanitary Pumps  
6,000 Boilers  
6,000 Refrigerator Trucks

#### In Butter Manufacturing Establishments:

3,000 Storage Tanks  
6,000 Sanitary Pumps  
6,000 Vat Pasteurizers  
3,000 Butter Scales  
6,000 Floor Trucks

#### In Cheese Manufacturing Establishments:

2,500 Cheese Vats  
1,500 Sanitary Pumps

The foregoing data gathered and interpreted for the porcelain enamel business brought into focus many new markets that were open for development and revealed that the markets usually tapped by porcelain enamel plants had expanded to huge proportions.



"THE BACHELOR'S DREAM"—A MARKET WE'VE MISSED

COURTESY ELJER COMPANY

## AGAIN MAKING TIME-PROVED FRITS FOR CENTURY CUSTOMERS



With war work in the background, Century's organization and modern frit-making equipment are again turning out time-proved frits in increasing quantities for Century customers.

Experienced men and modern equipment are again on "full time" in the production of porcelain enamel frits that produce the kind of ware you want — and keep it up day-after-day, year-after-year.

Century makes a complete line of time-proved frits for all purposes. If you haven't tried Century enamels, why not start "from the ground up" and run a trial of "Century" ground coat enamel? We serve some of the country's finest enameling plants — We can serve you too.

For trouble-free, economical operation in your enameling plant you can't go wrong with Century. Give us a trial! The answer is in results!

---

*Century Vitreous Enamel Company*

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6641-6661 SOUTH NARRAGANSETT AVENUE • CHICAGO • ILLINOIS

DECEMBER • 1945 finish

→ from Page 40

From 1939 to 1940 he was Research Fellow at Ohio State University. In 1940-41 he was assistant professor of Ceramic Engineering at Georgia School of Technology.

Work as Research Associate at the National Bureau of Standards for the Porcelain Enamel Institute, prior to the war, brought Mr. Coffeen in close touch with current enameling problems. During the war he served as Glass Technologist in the Optical Glass Plant at the Bureau.

#### New York Metropolitan Section of A.C.S. formed

The New York Metropolitan Section of the American Ceramic Society was organized Wednesday, October 17, at a meeting at the Building Trades Employers Association Building. C. Forrest Teft, president of the Society, presented the charter to Joseph A. Pask, acting chairman.

Following the charter presentation, Emerson W. Emrich, R. T. Vanderbilt Laboratories, took charge of the

meeting and presented the report of the Nominating Committee. The following officers were unanimously elected:

Chairman: Joseph A. Pask, Research Dept. Lamp Div., Westinghouse Electric Corp., Bloomfield, N.J.

Vice Chairman: James D. Tetrick, Metal & Thermit Corp., Carteret, N.J.

Secretary-Treasurer: Perry C. McCollom, American Crucible Co., Shelton, Conn.

Councillors: James B. Austin, Research Lab., U. S. Steel Corp., Kearny, N.J., and Chester C. Treischel, R. T. Vanderbilt Co., New York, N.Y.

Mr. Pask announced that the officers would act as the Executive committee and would meet soon to determine the program for the season.

#### Pittsburgh section ACS to meet

Tuesday night, December 4, will be Penn State Night for the Pittsburgh Section of the American Ceramic Society. A tribute to the ce-

ramic activities at Pennsylvania State College and those who make them possible will be the order of the evening.

The meeting will be held at Mellon Institute at 8:15 P.M., following a dinner at Webster Hall at 6:30. Included in the business of the evening will be the election of officers for the 1946 season.

#### Eastern Enameler's meet Dec. 15

The next meeting of the Eastern Enameler's Club will be held at the Ritz Carlton Hotel, Philadelphia, on December 15. Principal speakers are to be Harry Parker, enameling superintendent of the Glenwood Range Company, whose subject is "Automatic Enameling," and Carl G. Strandlund, vice president of Chicago Vitreous Enamel Product Co., who will speak on "The Engineer's Viewpoint on Porcelain Enamel and Its Architectural Possibilities."

The formal meeting will be held  
to Page 54 →

Lower your rejects by making your enamels with

## DE-IONIZED WATER

Reduction in rejects and elimination of copper heading have been obtained in leading ceramic plants when De-ionized Water was used in making the enamel. The varying acidic and basic reactions of natural waters affects the proper flocculation characteristics of frit and clay. Adjusting the enamel to make it function properly is costly as it requires materials and takes time.

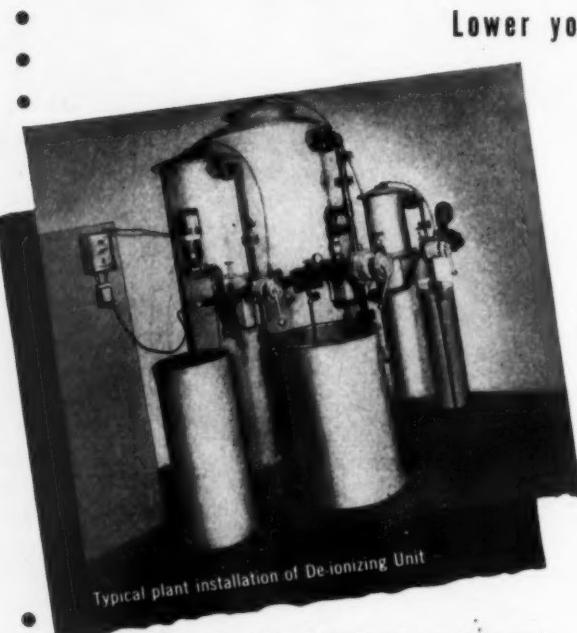
You can assure yourself of a reliable water for enamel, by installing an ILLCO-WAY De-ionizing Unit. It will produce all the water your plant requires for capacity operation at a cost from 1% to 10% of that of distilled water. No fuel required, no cooling water. Maintenance is simple—no periodic dismantling for cleaning. Write for literature today!

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# Enameling activity on the West Coast

AS REPORTED BY • *Elsa Gidlow* • SAN FRANCISCO CORRESPONDENT FOR FINISH

BOTH porcelain enameling concerns and users of porcelain are getting into action again in Northern California, but slowly. The main reason for this lagging is a continued shortage of materials and the fact that, despite releases from war plants, skilled workers are not yet coming back into the industry in any appreciable numbers. Threats of labor difficulties are causing some caution too. Users of porcelain enamel are moving slowly because so many of them are experimenting and some of the potentially big users are new in the field — Henry Kaiser, for instance. But while the reconversion may be slow, and the expansion into fields that are new on this Coast probably will be cautious at first, every one in the industry agrees that the prospects are good for a considerably larger use of porcelain in California than was looked for a few years back, not only in signs but architecturally and for a long list of household appliances and gadgets.

In the San Francisco-East Bay region, Northern California's only two enamelters, Ferro Enameling Company and Payne-Mahoney, both are fully reconverted to their peacetime activities, but they are a long way from full production as yet. There is any amount of work, but not enough steel.

## Steel shortage acute

Not much steel is coming in here from the East and the tonnage put out in the West so far is small. Columbia Steel Company, subsidiary of United States Steel, is doling out its available supplies on a quota basis. Any one who gets more than 10% of his needs is lucky.

Spokesman for Columbia Steel call the situation "tough" and "a big headache," with all industry here up against it for material. Columbia is making improvements at its Pittsburgh, California plant, adding a cold reduction unit, and this plant intends to turn out 325,000 tons of sheet steel annually.

A factor that makes the steel supply situation worse now (November) than it was even a couple of months ago is the recent withdrawal from the West Coast market of a number of Eastern mills too far from a water port to ship direct to the West Coast by water. Since these plants with no port facilities must absorb the railroad freight cost (around \$8 the ton), as long as they can sell all they produce close to home they are not interested in competing with those able to sell at lower cost in California.

Henry Kaiser, out to buck the "steel trust," promises the West plenty of its own steel when he gets his steel plant activities integrated, but that's in the future, and meanwhile all users in the porcelain enamel fields are taking what they get. Stoves, refrigerators, meat cases, freezers and all the more essential articles are allowed precedence on what materials are released, with sign and architectural users feeling like stepchildren.

Howard Brooks, of Ferro in Oakland, says, "The enameling business looks good; we are converted and ready, but we are being held up on supplies — mainly steel — and on shortage of competent help." Ferro will handle both sign and architectural work, but predominantly signs. "There's no lack of business, if only we could take it on."

## New plants and plant expansion

Payne-Mahoney is preparing for the immediate future with plant expansion work. They have started construction on a plant addition.

"Apart from materials shortages, which is everybody's woe, our chief problem so far is manpower," Denis Mahoney says. "We have only two skilled men left of our original crew — the rest are green — and with only two to do the breaking in, it's slow work building a new crew." It seems that the men released from the Armed Services are not yet getting back into porcelain enamel work.

This firm will do general porcelain

enamel jobbing work rather than signs or architectural — at least until more materials are released for the latter type of work.

Another sign of porcelain enamel expansion in California is the activity of Norris Stamping and Manufacturing Company, Los Angeles. Ken Norris, known as an active exponent of cheap steel for the West Coast, has taken on a number of lines from Sears Roebuck & Co. These will include refrigerator cases, bathtubs, washing machines and related items.

W. R. Ames Company, metal works, San Francisco, are planning to produce porcelain enamel steel sinks with enamel kitchen cabinet, the units to harmonize in color and style with the new stoves to be produced here. Although this firm is definitely scheduled to go into this sort of postwar fabrication, they are not prepared until near the end of the year to go into details or predict how extensive their operations will be. They will job out the porcelain end of the operation.

The San Francisco Bay region may have a new porcelain enameling plant in the making. Two young men, formerly with the Graham Stove Company, are reported to be setting up a jobbing plant at Newark, California. They are Henry Field and J. Springer.

A machinists' strike which broke at the end of October was giving the industry some headaches. It is not certain as this is written to what extent porcelain enameling plants may be affected, but the industries they serve in some instances are hit and it is possible that jurisdictional disputes may arise.

## Kaiser Products planning

### "big things"

It is an open secret that Payne-Mahoney are working with the newly formed Kaiser Products, a Henry J. Kaiser subsidiary organized recently with the announced intention of mass producing electric household appli-

ances. When the news went out of Kaiser's intentions in this direction, he was said to have developed for production and sale a vacuum cleaner, dishwasher, and washing machine, with refrigerator production mentioned as a future aim. Selling price of the dishwasher was reported as \$99.50.

To date, Kaiser Products has not got beyond the experimental stages on any of these items, although the dishwasher is most advanced. Kaiser is reported to be seeking "the ideal shape" for his machine, and when this has been found, and the bugs eliminated, they will go ahead and produce some demonstrator units. Another Kaiser project is a cabinet-type combination dishwasher, refrigerator and sink, all in a single unit for kitchen installation.

Whether the Kaiser company, once it gets into production, will continue to farm out the enameling end of its production has not been announced. No doubt it depends on the kind of service they can get from jobbers. As one porcelain enamel man put it, "Appliance manufacturers actually do not like to do their own enameling as a rule. They don't save any money. They do have control. If the enameler in the field can give them the service and the attention, and guard against production bottlenecks for the manufacturer at the enameling end, they ought to keep a good deal of the business."

#### Production rate is a West Coast problem

For appliance production on the West Coast to become a profitable business, large production must be achieved. To the hundred-a-day production of units enjoyed here, the East can place one thousand to three thousand a day, with consequently lower costs and a better competitive position on prices. The problem for Western producers is to turn out appliances that will be competitive in price, with comparable quality.

#### The architectural porcelain enamel picture

As the West goes into industrial peacetime production to make up for its lost war orders, porcelain enamel

men here see a greatly expanded market for architectural porcelain if it is sold right.

Frank Allen, San Francisco, is one who believes this. Allen, who years ago was connected with Ferro in Oakland, has now launched his own Architectural Porcelain Construction enterprise. Allen's office will sell the job and provide the design and engineering and on-the-job construction, farming out the enameling. Allen has fifteen to eighteen architectural jobs of varying sizes under way or completed, mostly store fronts and night clubs, bars, etc. One of the larger jobs is additions on upper floors of the Union Pacific ticket office on Powell Street in San Francisco. The new work will continue the porcelain frontage up to the third floor.

#### Big future for signs

The sign men feel that they are still marking time, for a number of reasons. A representative of one of the largest sign makers on the Coast, 90% of whose pre-war sign business was in porcelain-faced signs, says shortage of steel, manpower problems and the fact that colors are limited so far, all make reconversion of the sign business very low. He is E. J. Walters, district sales manager

for Electrical Products Company, who have branches or service connections in several Western cities. "Sign production so far is small and delivery slow, for the reasons I have mentioned. We are handicapped, too, because we are not yet entirely out of war work. We must be one of the few firms still working on Government orders. This is taking up portions of our plant important to our business if we are to get into full sign production." All of Electrical Products Company's plants are still only in partial production. "We're anxious to get our salesmen out in the field again," Walters says, "and we hope by the first of the New Year that we'll be able to start selling full blast."

There is news of various of the larger wholesale and retailing enterprises showing increased interest in porcelain enamel, firms like Borden's Dairy Delivery, who plan to use porcelain extensively on soda fountain installations which they own and lease out to store and fountain owners. Borden's also specify porcelain on all their ice cream cabinets, thousands of which are in circulation. Some new designs are being worked out for this firm, who also make very

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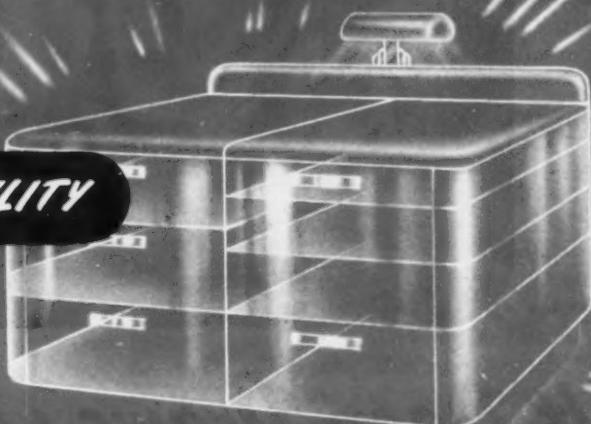
NOW — WHAT DO I DO WITH THIS?

DECEMBER • 1945 finish

# Main Street SALES

DEPEND ON

PRODUCT APPEAL *and* UTILITY



Porcelain enamel is the practical finish for stoves, heaters and refrigerators. When correct principles of design are applied and Hommel Frit used, life-time beauty and utility are the result. Many stoves, heaters and refrigerators are now protected with lifetime porcelain enamel that have been developed and pioneered by the O. Hommel Co.

Stoves, Refrigerators and Heaters demand Porcelain Enamel Frit with the correct coefficient of thermal expansion—extreme resistance to abrasion—ability to

withstand wide and sudden temperature changes—resistance to organic and mineral acids—wide firing range—elasticity—all to be found in a Hommel Frit.

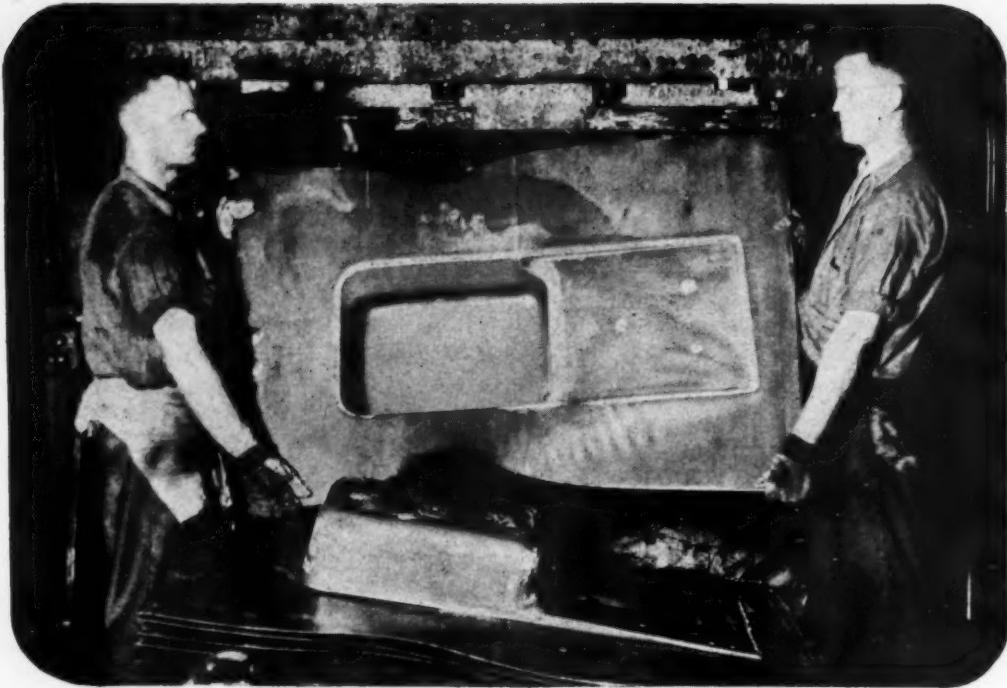
Many of these applications require special colors, and Hommel Enameling Oxides, Graining Pastes and Squeegee Colors, have been developed with particular properties to meet the need.

Call Hommel Service Engineers for suggestions from Designing to Plant Production. They roll up their sleeves and go to work with you on your problems. Write or wire today.

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Pacific Coast Agents  
L. H. BUTCHER CO.

—World's Most Complete Ceramic Supplier—



## *It Deep Draws with Fewer Flaws*

### **It's Toncan Enameling Iron with special deep drawing qualities**

If rejects at the draw press have been cutting your production efficiency, you'll find one answer to your problem standing front-and-center in the view above. It's Toncan Enameling Iron.

These Toncan Enameling Sheets were specifically processed to be formed into kitchen sinks by deep drawing. Consequently, they draw smoothly into the deep recess without strain-lining, wrinkling or cracking. Rejects have been reduced to a minimum.

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in large enameled panels after repeated firings—or to provide any desired combination of these qualities.

Toncan Enameling Iron is produced by men who have studied vitreous enameling practices for years and who have specialized in making a sheet metal for that purpose.

Check into the performance records of Toncan Enameling Iron Sheets in production like your own. You may find a better way to improve quality, speed output and reduce the cost of your production.

**REPUBLIC STEEL CORPORATION**

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*Republic*

**TONCAN ENAMELING IRON**

Reg. U. S. Pat. Off.

# The Washington round-up

By Wilfrid Redmond

The Civilian Production Administration, which took over the job relinquished by WPB on November 3, will continue controls on scarce materials such as tin and lead, and will retain powers to hold down inventories and to break bottlenecks when they interfere with the orderly transition to peacetime production.

Jack D. Small, who heads CPA, recently appeared before the House Judiciary Committee to urge extension of the Second War Powers Act, which expires December 31, 1945. This is the Act under which CPA issues allocation and conservation measures, such as the tin and lead orders, and PR-28 and PR-32, the priority and inventory orders.

Retention of these controls was also recommended by John W. Snyder, director of the Office of War Mobilization and Reconversion, before the same committee. These measures are necessary to keep the reconversion program from stalling, he told the committee.

The supply position of lead is extremely critical, so much so that the outlook is more serious than that of tin. It is pointed out that the tin situation may be eased within the next six months as the result of the restoration of facilities in Malaya and the Dutch East Indies, but that lead may be in precarious supply for the next three or four years. The reason is that lead supplies are being diverted to other markets than that of the U.S. Mr. Small, as chief of staff of WPB, recently reported to the Office of War Mobilization and Reconversion that at the present ceiling price of lead U. S. Consumers can not compete on the world market for lead supplies. He did not recommend that OWMR authorize OPA to increase the ceiling price, but other WPB (now CPA) officials say that this is the only way we can increase our lead stocks.

## Household refrigerators

OPA has established ceilings for

new household refrigerators that will hold manufacturers, distributors, and retailers substantially at March 1942 levels. A new regulation (MPR 598) was issued to cover this pricing situation.

Ceiling prices for manufacturers are those in effect on March 30, 1942, for the same or closely similar models, if these prices are higher than those computed according to the individual reconversion pricing formula included in the regulation. Under this formula the manufacturer is permitted an adjustment over his October 1941 prices to reflect increases in the cost of materials and in the wages of workers. He can take his profit margin on his own 1936-39 average, or half the industry average, whichever is greater.

## Sears gets pricing standard for converting ice refrigerators

Sears, Roebuck & Company, Chicago, has been granted a maximum price of \$99.50 for the service of converting a Coldspot Ice Refrigerator into a Coldspot Electric Refrigerator. The conversion price covers labor and materials, supplying the mechanical refrigerator units, and pick-up and delivery incidental to the service.

Uniform ceiling prices for sales by distributors of Kelvinator and Leonard refrigerators to dealers have been established by OPA at the request of the Nash-Kelvinator corporation.

## Survey shows distributor-dealer margins

To establish a basis for distributor-dealer and retailer readjustments, OPA made an extensive survey of initial and realized margins of these establishments. It is estimated that the readjustment based on this survey, reduces the spread between initial and realized percentage margins by about one percentage point, both for distributors and dealers. Thus the survey disclosed that distributors of refrigerators in 1941 had an average initial margin of 20.7 per cent and

an average realized margin of 17.7 per cent on sales of refrigerators. As a result of this readjustment in prices, the distributors' initial margin will be reduced to 19.7 per cent, a reduction of one percentage point. The distributor, therefore, should realize a return at least as high as those which existed in 1941, says OPA.

The survey also covered 620 specialty appliance dealers. It showed that in 1941 these dealers had an average initial margin of 34.4 per cent and an average realized margin of 30.3 per cent. Census figures indicate that specialty appliance and radio dealers together accounted for slightly more than 50 per cent of the volume of retail sales of major appliances, including radios, handled in 1939. A 3 per cent reduction in the margin of appliance stores will lower the average initial margin a little more than one percentage point—that is, to an average a little over 33 per cent. This, according to OPA, will leave dealers with about 3 per cent spread between the initial margins allowed under this regulation and their average realized margins in 1941.

Manufacturers who choose the individual price adjustment method must file their applications before November 10. Those who do not file before this date may file under the reconversion pricing formula announced July 23 by OPA. This is the general reconversion pricing regulation and is similar to the refrigerator pricing action.

OPA pointed out that the margin reductions set forth in the new regulation for postwar household mechanical refrigerators are paper reductions and in many cases will yield returns even higher than those realized in 1941.

## Stoves and thermostats

Domestic cooking and heating stoves (except electric ranges) and thermostats for use in gas and electric cooking ranges have been added to OPA's list of reconversion products. This means that these products have been added to the list of industries that dropped below 50 per cent of their normal production during

to Page 54 →

## "Vitreous Enamelling" in Australia

(Continued from Page 16)



Vitreous enamelled advertising signs are used extensively in Australia.

tically everything for the home in the way of metal products. In addition, we have a woodworking shop where parts for beds, cots, ice chests, etc., are built. Other products including some that have been mentioned, are steel drums of all sizes, all kinds of tin cans, canister sets, bottle tops, window frames, steel troughs, fire place fixtures, dairy equipment, steel lockers, and many others.

### Enamelled products

**Stoves** — We build electric, gas and wood fired. The principal difference between these and those of American manufacture is that our wood stoves are designed to burn wood in large pieces, so that the combustion space covers the whole width of the top of the stove, instead of being on one side of the oven. Electric and gas stoves differ in that they use far more cast iron, and are of heavier construction and less streamlined appearance, the public having been accustomed to British designs, intended to remain in use for 30 or 40 years. Stoves are produced in a variety of colors, including ivory, creams, greens, blues and gray.

**Washing machines** — We make and enamel our own tubs in plain green, mottled finishes in various colors, and some in white. The frame work and other parts are fabricated and

painted. All are of the wringer type, and are made under license from a Canadian manufacturer.

**Refrigerators** — In this instance we fabricate and enamel parts for refrigerators built by other manufacturers. As in the United States, the refrigerator liners, crisper pans, inner doors, etc., are all vitreous enamelled.

**Ice chests** — In Australia it is common practice to vitreous enamel the interior of ice chests. This is another of the finished products manufactured by our company.

**Lighting reflectors** — A variety of styles in lighting reflectors are manufactured, both for incandescent and fluorescent lamps. Many are green enamelled outside — some blue.

**Enamelled tile** — Standard enamelled sheets are produced with stencilled tile designs suited for walls for bathroom, kitchens and butcher and provision shops.

**Table tops** — Both smooth and recessed vitreous enamelled table tops are produced.

**Kitchenware** — A complete line of kitchen ware for cooking and preserving is manufactured in many colors. Many plain colors are used with contrasting heads.

**Hospital ware** — The enamelled hospital ware is usually in white with blue or black.

**Signs** — We produce signs of all types, both by the stencil method and with screen process designs, and with transfers.

**Architectural** — We have treated the fronts of some small shops, and we hope that the success achieved there will point the way to an expansion in this field after the present restrictions are lifted.

### War production

As in the case of the American and Canadian companies which we visited, our plant has been devoting its facilities to war production. At least 80 per cent of our production has been on this type of work, including such items as portable cookers, ammunition boxes for shells ranging from 6-pr. Anti-tank up to 6" naval and for .303 rifle cartridge, cardboard containers for mortar shells, steel drums for packing food for the tropics, petrol drums for the Army, beds for hospitals, army sanitary ware and utensils, and many other products.

One interesting enamelled product is the water bottle used by the Australian Army. The standard water bottle or "canteen" is vitreous enamelled in ground coat and one blue cover coat. These water bottles were produced by our company during both the 1st and 2nd World Wars. The present model is similar in design to those used in World War I, except that they are fabricated in a different manner. The Australian Army also uses great quantities of cups, plates and that type of hollowware.

### Expect expanded market for enamelled products

As the reader will have noted, enamelware is not new to Australia, having been produced and used extensively since late in the Nineteenth Century. The people of Australia have a great respect for the beauty and cleanliness of enamelled products. We fully expect that we will not only continue to enamel those products formerly enamelled, but that there will be many possibilities for activity in new fields.



## Ideas in mesh . . .

Du Pont will help you get—and keep—your application methods in mesh with new developments. Our technical men will work with you in selecting new procedures, and the right materials, to speed your production and save you cost. Ideas in mesh mean progress.

For the future, Du Pont can be your source of top-quality color oxides. These Du Pont colors are standardized for hue, strength and stability. For samples, and for details on Du Pont Technical Service available to you, just write E. I. du Pont de Nemours & Co. (Inc.), Electrochemicals Department, Wilmington 98, Delaware.

## Du Pont Ceramic Colors



BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

## New pickling room has many features

(Continued from Page 18)

### Pilots ignited by electricity

Another electrical innovation is the use of an induction coil and ordinary spark plug for lighting the pilot light in each burner. The coil transformer operates directly from a 110-volt supply, and furnishes 9000 volts to the spark plug terminal. This installation has proved very effective, and eliminates the danger and inconvenience inherent with hand-lighted, pilot light installations.

Each tank is provided with a standard mercoid bulb temperature control apparatus capable of maintaining solution temperatures within plus-or-minus 5 degrees F. A roomy and well-lighted subterranean passageway, accessible through a trap door in the cleaning room floor, extends the entire length of the tank pits, and houses the burners, burner controls, temperature controls, and manifold piping system. A room adjacent to this passageway contains the solution pumps, a 1000 gal. raw acid tank, and an oil pumping plant.

All piping in the manifold system is painted according to standard color code to designate what it carries. The piping, except the Monel metal pipes used in conjunction with the acid

tanks, is of standard grade iron.

### "Launching" the tanks

One more item which may be of interest to some, is the fact the tanks were "launched" in place. When the time came to have the 8000 lb. tanks put in place in the tank pit, we found that it would be three weeks before we could get the moving company to do it, and at a cost of approximately three hundred dollars per tank. It was then said: "Why not launch them like they do ships?" We did this by inflating a foot-ball bladder in the sewer opening and filling the 20' x 80' x 6' pit with water from our well. It only took three men, Sunday, and a half-day Monday to float the tanks in place. A wooden bung was then removed from the drain hole which allowed the tanks to fill with water and settle in place.

With many years of experience in cleaning enameling iron to guide us, we have tried to foresee all possible contingencies and forestall them in the basic design of our cleaning and pickling equipment. At the same time we have incorporated many conveniences that, to our knowledge, have not been employed prior to this time.

too much to be desired in the matter of duplication or consistency of operation, and the motor driven type of equipment is not sufficiently flexible.

The removal of the flash and upset deposit from a flash weld always presents a problem. Equipment is now available that will trim the flash within .002" of the surface, trimming both surfaces simultaneously. If the shape of your article will not lend itself to the shaper type of tool just mentioned, then grinding or removing with an air chisel are alternate methods.

It will be apparent that in this brief paper there was no attempt to exhaust the subject under discussion. The purpose of the information given is to start to bring the problems of the enameler and the welding engineer closer together. By working together on common ground, much can be accomplished that will result in direct benefit to our respective industries, and particularly to the manufacturer of finished products.

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### Ahlsweide retires from California Metal Enameling

Roland B. Ahlsweide has resigned as secretary from California Metal Enameling Co. following 33 years of service. Announcement was made by J. T. Penton, president, who voiced his regrets concerning Mr. Ahlsweide's decision to retire.

### Other personnel announcements

Factory management will be handled by Ernest E. Radeck, who is also treasurer and has been with the company since 1922.

Melville E. (Bub) Blackburn will be factory superintendent. He was with the company prior to the war, and returned about one year ago.

Working with Mr. Blackburn under Mr. Radeck will be Howard Burlingame, formerly with the company as a ceramic engineer. During the war he was a Lieutenant Commander in the Navy.

Nelson W. Neice, with the company since 1921, is vice president in charge of sales.

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Since porcelain enameled ware utensils are non-porous and cannot absorb food odors, delicately flavored vegetables, fruits, meat and cheese are best when prepared in them.

## Enameling activity on the West Coast

(Continued from Page 46)

heavy use of porcelain for signs and store frontages.

Oil companies, one of the West's largest users of porcelain enameled signs of all shapes, sorts, and sizes, are reported to have interesting plans in work. One of these, Standard of California (who used to be known as Standard Oil Company of California), have already started work on a sign and station revamping program

involving an eventual very large use of porcelain enameled signs and trims in a new color scheme. The new designs and colors will be used by Standard dealers featuring the post-war Chevron brand of gasoline. The program may run to thousands of station renovations throughout the California territory once materials are available in quantity.

## Resistance welding

### prior to porcelain enameling

(Continued from Page 21)

to a minimum. Also, the upset allowance should be as great as possible to insure as much as possible that the seams are homogeneous and entirely without cavities.

Since flash welding with a low secondary voltage requires a slower platen travel speed, hydraulically operated equipment is to be preferred. Hand upset equipment leaves



SMOOTH PERFORMANCE MAKES  
**UVERITE** THE STAND-OUT **OPACIFIER**

for... porcelain enamel

Smooth performance makes Uverite rate ace-high with production men. ★★ The opacity and coverage of Uverite Enamels run uniformly high. Burning range and clean surface make Uverite Enamels easy working. ★★ These are a few outstanding qualities which indicate why more production men use Uverite than any other opacifier. When you want a better, whiter surface . . . use Uverite as your mill addition opacifier. Large stocks are available and shipments are unrestricted.

THE **HARSHAW CHEMICAL CO.**  
1945 East 97th Street, Cleveland 6, Ohio  
BRANCHES IN PRINCIPAL CITIES

→ from Page 49

the period 1941-45. The manufacturer in this industry does not have to show that his own production was cut during these years when he applies for a reconversion price for his product. Industry-wide increase factors are issued to manufacturers on this list which appears in Appendix A of the Reconversion Pricing Orders SO-118 and SO-119. These increase factors permit an increase over the 1941 price of the product.

#### Cooking and kitchen utensils

A profit factor of 2.4 per cent has been established by the OPA for cooking and kitchen utensils made of metal — except aluminum ware. This means that the manufacturer of these products may apply a profit margin of 2.4 per cent over his 1941 costs of manufacture. Actually, this margin is one-half the industry-wide profit margin for 1941.

In the case of refrigerators and automobiles, OPA permitted the manufacturer to take his own profit margin over cost in 1941, but other industries were assigned an industry-wide profit factor to apply to their own price determination. Refrigerators and automobiles did not receive industry-wide profit factors because their cost history was too diverse to strike an average factor. To have attempted to do so might have permitted inflationary prices.

The action was taken because the corporation applied to alter its zoning prices, and those of its distributors, to enable it to establish a single retail ceiling price for sales throughout the 48 states and the District of Columbia. Prices established for sales by distributors to dealers of the Kelvinator and corresponding Leonard models in carload lots are as follows: CS-7, \$91.34 each; C-7, \$103.85; CD-7, \$112.13; and M-9, \$150.35.

#### Chemicals supply position

The position of a number of the important chemicals used by the ceramics industry is as follows:

**Borax and Boric Acid** — Temporarily in tight supply because of an increased demand for enameling uses and because of the West Coast strike in the borax industry.

**Lead Silicate** — Lead is still under allocation and is not in free supply.

**Sodium Nitrate** — Supply is adequate for minor quantities needed for industrial use. Large quantities controlled because the material is used in fertilizers.

**Titanium Oxide** — In poor supply because stocks depend upon an adequate quantity of ilamite obtained from India.

**Soda Ash** — In medium supply.

**Barium Carbonate, Hydrochloric Acid, Sulphuric Acid and Aluminum Hydrate** — All in adequate supply.

All requests for antimony oxide from the ceramics industry are being taken care of, according to the Tin-Lead-Zinc Division. Requirements of the industry are increasing rapidly as full utilization of facilities is being made, but the CPA division reports that no bottlenecks are in sight.

#### INDUSTRY NEWS & PERSONALS (Continued from Page 44)

immediately following a luncheon scheduled to start at 1:00 P.M.

#### Chicago Club to meet December 8

The next meeting of the Chicago District Enameler's Club will be held Saturday afternoon, December 8, in the Lincoln Room of the La Salle Hotel. The program committee reports that the subject "Automatic Spraying and Special Developments in the Field of Spray Equipment" will be covered.

The program will include a paper on "Automatic Spraying in the Enameling Industry," by A. W. Gudge, Binks Manufacturing Co.; a report on "Electrostatic Spraying as Applied to the Field of Porcelain Enamel," by a representative of the Harper J. Ransburg Company; and a paper on the "Application of Automatic Spray-

ing in the Porcelain Enamel Industry," by a representative of the DeVilbiss Company.

Special entertainment during the luncheon is promised.

#### Central District Enameler's Club to be revived

It is planned to revive the Central District Enameler's Club organization which has been inactive during the war period. A *tentative* meeting date has been set for Friday night, January 11, when it will be planned to hold a dinner meeting at the Hollenden Hotel, Cleveland. It is reported that two good speakers have been engaged for the meeting.

Contact Burton Longwell, secretary-treasurer, c/o Republic Steel Corporation, Republic Building, Cleveland 15, Ohio.

#### Clyde Porcelain Steel plant destroyed by fire

A fire of unknown origin starting on Sunday afternoon, November 11, completely destroyed the original plant of the Clyde Porcelain Steel Corp., Clyde, Ohio. The plant destroyed included 110,000 square feet of floor space and all equipment. Facilities for the production of porcelain on steel tile were completely destroyed. Also included were four box type furnaces and part of the assembly plant devoted to the production of Bendix automatic washers. Plant No. 2, which is devoted entirely to the assembly of Bendix products was not harmed; neither did the fire reach new additions to the plant which include continuous enameling production lines.

A phone call to Clyde brought the following report from T. E. Stokes, executive vice president: "We are moving fast to rebuild the destroyed

unit complete with additional production equipment. Drawings are being rushed for the new plant, with a possible addition of 30,000 square feet to the original 110,000 which would give us a total of 140,000 square feet in the new building. New equipment will include two new box type furnaces, one new large continuous furnace, and two continuous tile furnaces. Two tile production lines will replace the one destroyed. We will be back in production before the end of the week (week of November 11) on Bendix. We hope to rebuild to the point where we will be back in limited production on tile within six weeks, and expect to have everything completed so that all units will be in production within four months."

The fire loss is reported to have been covered by insurance.

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